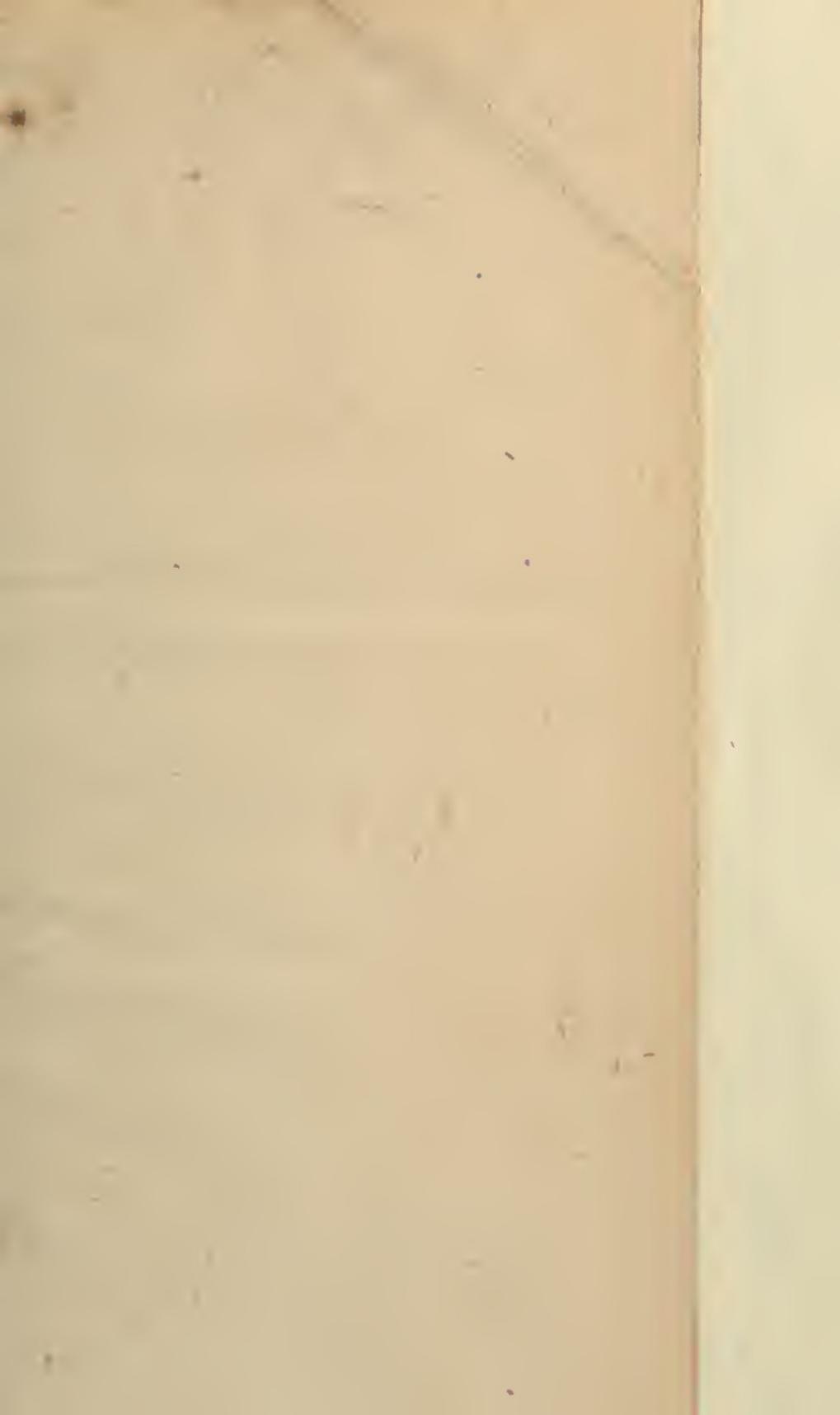
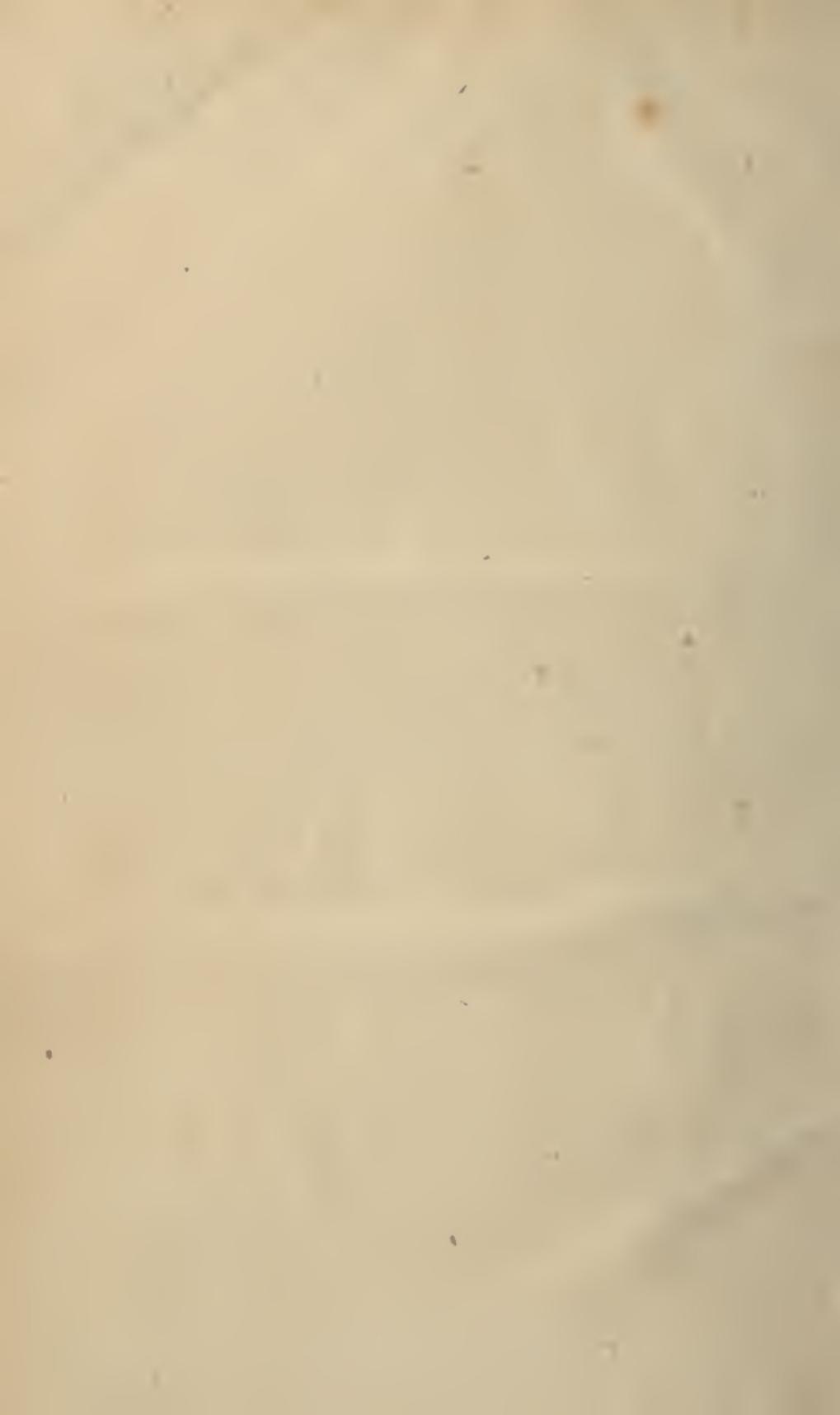


22 - 4





Criticisms on the First and Second Editions of this Work.

"The Influence of Hot Climates on European Constitutions is here placed in a newer and clearer light than in any work with which we are acquainted."—*London Med. and Phys. Journal.*

"The goal at which our critical analysis is to terminate, would now be fairly in view, if '*the Tropical Hygiene*,' which occupies no small share of a work, in which almost every thing is superlatively excellent, did not stand in our way, and yet remain to be passed in review: our limits forbid us, however, to bestow that time and labour upon this part of Dr. Johnson's Book, which, to borrow his own quotation—'Præstat Argento ;' for in no work do we remember to have seen the important subject of preserving Health in Tropical Climates, so ably, so clearly, and so philosophically treated. The easy, lucid, and entertaining manner in which it is written cannot fail to render it equally interesting to the soldier, sailor, merchant, or traveller, as to the medical part of the community."—*New Med. and Phys. Journal.*

"I highly approve of almost every line in Dr. Johnson's Work, which I recommend to all the Medical Gentlemen going to India, as by far the best, and indeed the only good Book written on the subject." 'William Dick,' Principal Physician to the East India Company.—*Vide Dr. Dick's Letter to the Editors of the New Med. and Phys. Journal.*

"This volume contains most interesting and important information. No Medical Men intended for a tropical field of practice should proceed to their destination without possessing the book. There is not, in truth, a more faithful or a more judicious guide. It will divest them of those absurd prejudices which ignorance and arrogance have united to give authority to. It will store their minds with facts of the highest utility, and amply supply them with the surest means of crowning the assiduous exercise of their arduous and important duties with success."—*Dr. Chisholme in the Edinburgh Medical and Surgical Journal.,*

"The Medical Public, I conceive, is very much indebted to Dr. James Johnson, author of the valuable practical work on the '*Influence of Tropical Climates*,' and an accurate ob-

server of Nature, for having so clearly illustrated the connexion between dysentery and deranged functions of the skin and liver."—*Armstrong on Typhus.*

"Dr. Johnson seems to be enthusiastic in his profession; has spent a great part of his life in tropical climates in both hemispheres; has observed well, and practised successfully and now in presenting the result of his personal experience to the public, has published a volume abounding in practical knowledge, which we recommend in the strongest manner to the attention of the profession, and indeed to every person going to tropical climates, on account of the very valuable observations which interest the soldier, the sailor, and the merchant, as much as the physician."—*Edinburgh Medical and Surgical Journal.*

"Dr. James Johnson has the distinguished merit of having written the best, by far the best book on the diseases of warm climates. He not only presents every important fact, but boldly draws original and satisfactory conclusions, and thereby lays down admirable rules for both the prevention and cure of diseases incidental to tropical regions."—*Annals of Medicine, &c.*

MEDICAL CLASSICS

SELECTED AND REVISED

BY

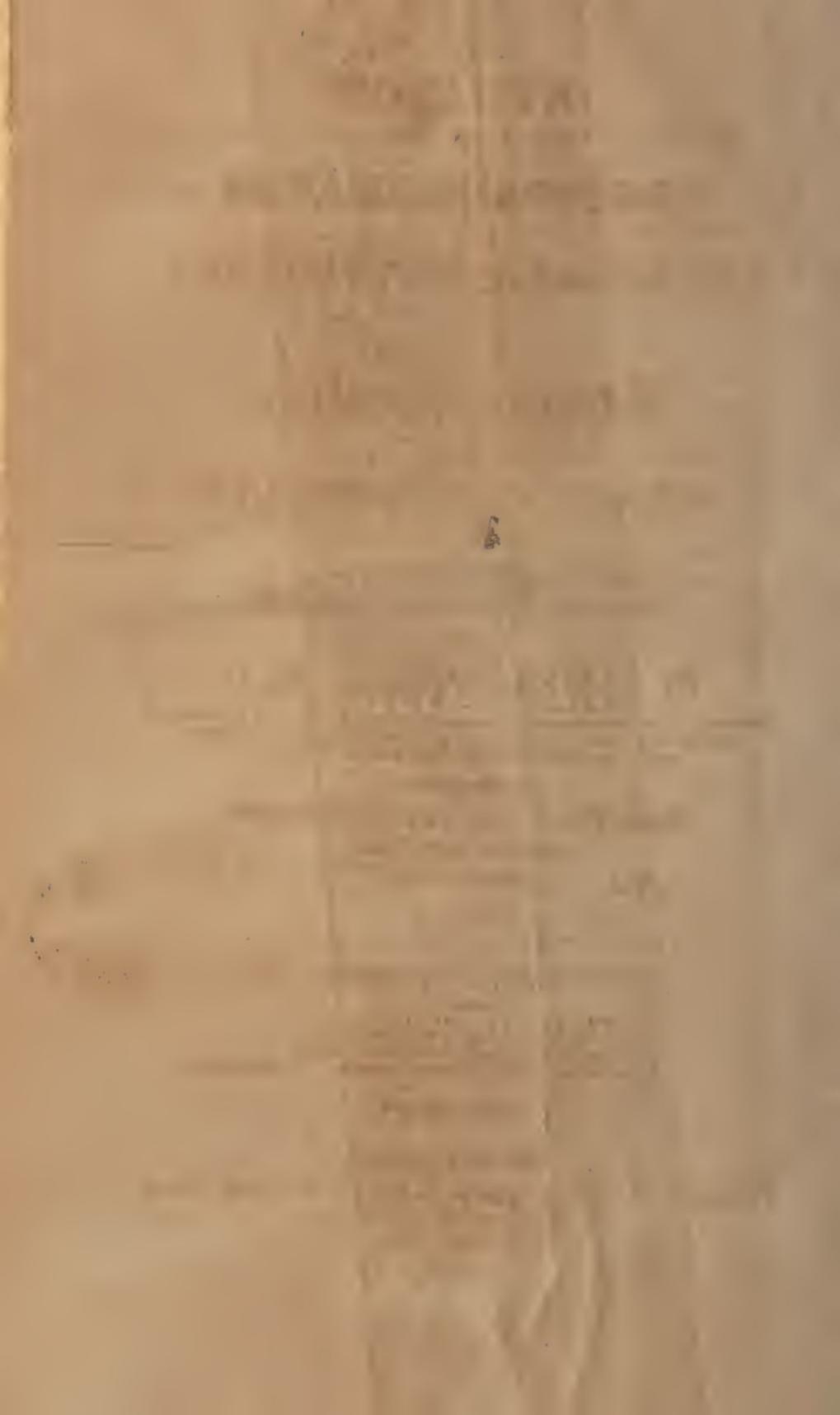
PHILIP YNG PHYSICK, M. D.

PROFESSOR OF ANATOMY,

AND

NATHANIEL CHIPMAN, M. D.

PROFESSOR OF THE INSTITUTES, AND PRACTICE OF
PHYSIC AND CLINICAL PRACTICE IN THE
UNIVERSITY OF PENNSYLVANIA.



THE
INFLUENCE
OF
TROPICAL CLIMATES
ON
EUROPEAN CONSTITUTIONS.

TO WHICH IS ADDED
Tropical Hygiene;
OR THE
PRESERVATION OF HEALTH
IN
ALL HOT CLIMATES,
(ADAPTED TO GENERAL PERUSAL.)

By JAMES JOHNSON, M. D.

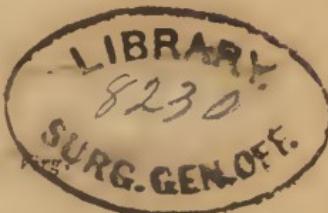
Author of "The Influence of the Atmosphere on the Health and Functions of the Human Frame," and Editor of the *Medical Register; or Quarterly Journal of Medical and Surgical Science.*"

FROM THE LATEST LONDON EDITION,
GREATLY IMPROVED.

VOL. I.

Hand ignarus mali miseris succurrere disco.

Study well the clime,
Mould to its manners your obsequious frame
And mitigate those ills you cannot shun.



Armstrong.

PHILADELPHIA :

Published by Thomas Dobson & Son, at the Stone House,
No. 41, South Second Street.
J. Harding, Printer.

1821.

WC
J67L
1821
v.1

TO

JOHN WEIR, M. D.

Naval Medical Commissioner, &c.

ANDREW BAIRD, M. D.

Inspector of Naval Hospitals, &c. ;

D. J. H. DICKSON, M. D. F. L. S. &c.

Physician to the Fleet ;

JOHN GRAY, M. D.

Late Physician of Haslar Hospital ;

DUNCAN McARTHUR, M. D.

Late Physician of the Royal Hospital, Deal, &c.

WILLIAM BURNETT, M. D.

Physician to the Fleet, &c. ;

ARCHIBALD ROBERTSON, M. D.

Fellow of the Royal Medical Society of Edinburgh, &c.

AND TO ALL HIS

NAVAL MEDICAL BRETHREN,

WHO HAVE

DISTINGUISHED THEMSELVES

BY

NATIVE TALENT, PROFESSIONAL ZEAL,

OR

SCIENTIFIC ACQUIREMENTS,

THIS

SPECIMEN

OF

Naval Medical Literature,

IS RESPECTFULLY DEDICATED

BY THEIR

SINCERE FRIEND AND BROTHER

OFFICER,

THE AUTHOR.

PREFACE TO THE SECOND LONDON EDITION.

A VERY large impression of this work having been distributed, and the demand still increasing, the Author has, for a considerable time past, employed his leisure hours in preparing a new Edition that might be yet more worthy of public patronage than the preceding. He has here endeavoured to combine every thing that is really and practically useful to the Tropical visitor or sojourner, in one volume, which, by means of small type and concentrated style, contains nearly *double* the quantum of matter in the first Edition, while it has not been sensibly increased in price or size. The labour, first and last, has been enormous; but he hopes not unprofitable. A new feature has been added to this Edition—the consideration of *tropicoid* climates, or those bordering on the tropics, the diseases of which, at particular periods, resemble and elucidate those of equatorial regions. For this plan he quotes the authority of his celebrated predecessor Lind, who has taken a still wider range than the present work embraces. The author is convinced that this is a most essential requisite in every treatise on the diseases of the Torrid zone. These diseases acknowledge no Cancer or Capricorn boundaries. The same class sallies occasionally from La Plata to the Scheldt.

It will sweep along the banks of the Ganges, the Euphrates, the Nile, the Tiber, the Guadaluquivir, the Chesapeake, the Mississippi, the Orinoco, and around every sinuosity of the great Western Archipelago. He then who studies the influence of Tropical climates on European constitutions, by *parallels of latitude*, will do so inefficiently. It is like studying the physiology of the stomach or liver, without taking into consideration the functions of surrounding viscera. An appeal may be made to the *parallel* between the valley of Egypt and the coast of Coromandel for the truth of this remark. It will there be seen that the climate and diseases of the one elucidate those of the other, and that the *parallel* has solved a problem in Etiology which has hitherto proved a stumbling block to Physicians—namely the question of an indigenous poison existing in India, and occasioning the prevalence of Hepatitis there.

The Author has, in this Edition, aimed at being both comprehensive and minute, in every thing relating to tropical diseases, and to tropical Hygiene. How far he may have succeeded, must be left to time, and the adjudication of the public voice.

St. George's-square, Portsea, 1818.

TABLE OF CONTENTS,

VOLUME I.

	Page.
Preliminary Observations,	1—6

PART I.

Primary or General Effects,	57
SECT. I. Perspiration,	8—15
II. Sympathy,	15—18
III. Biliary Secretion,	18—27
IV. Lichen tropicus,	27—30

PART II.

Specific Diseases, from page 51 of 1st. vol. to 227 of
2nd vol.

EASTERN HEMISPHERE.

SECT. I. Fever in general,	31—67
II. Endemic Fever of Bengal,	67—143
III. Coimbatore Fever,	144—155
IV. Guzerat Fever,	156—163
V. Seringapatam Fever,	163—173
VI. Bilious Fever,	174—204
VII. Coromandel Fever,	205—210
VIII. Endemic of Batavia,	211—259
IX. Hepatic Derangements,	259—326
X. Dysentery,	326—360
XI. Cholera Morbus and Mort de Chien,	360—377
XII. Beri Beri,	377—381
XIII. Dracunculus,	381—384

TABLE OF CONTENTS.

MEDITERRANEAN.

VOLUME II.

SECT. I. General Observations on the Climate ; and on Mediterranean Phthisis,	-	-	1 — 9
II. Mediterranean Fever,	-	-	9—27
III. Gibraltar Fever,	-	-	28—68
IV. Andalusian Fever,	-	-	68—83
V. Cadiz Fever,	-	-	83—92
VI. Minorca Fever,	-	-	92—109
VII. Malaria of Italy,	-	-	109—130
VIII. Sicily,	-	-	130—143
IX. Malta,	-	-	143—144
X. Egypt,	-	-	144—151
XI. Plague,	-	-	151—170

WESTERN HEMISPHERE.

SECT. I. Yellow Fever,	-	-	171—194
II. Mariegalante Fever,	-	-	195—212
III. Tetanus,	-	-	212—222
IV. Chesapeake Fever,	-	-	223—227
V. New Orleans Endemic,	-	-	294—345

PART III.

TROPICAL HYGIENE.

General Observations,	-	-	228—232
SECT. I. Dress,	-	-	232—241
II. Food,	-	-	242—253
III. Drink,	-	-	253—264
IV. *Exercise, &c.	-	-	264—274
V. Bathing,	-	-	274 ¹
VI. Sleep,	-	-	279—288
VII. The Passions,	-	-	286—295
Medical Topography of New Orleans,			294—345
General Index to the Work,	-	-	447—459

THE
Influence of Tropical Climates
ON
European Constitutions.

I BELIEVE it is a general opinion among Philosophers, that the Constitution of Man is better adapted to bear those changes of temperature, &c. experienced in migrating from a Northern to a tropical region, and vice versa, than that of any other animal. They proudly observe, that this power of accommodating itself to all climates, is a distinctive characteristic of the human species, since no other animal can endure transplantation with equal impunity. But, I think it would not be difficult to shew, that for this boasted prerogative, man is more indebted to the ingenuity of his mind, than to the pliability of his body.

To me, indeed, it appears, that he and other animals start on very unequal terms, in their emigrations. Man, by the exertion of his mental faculties, can raise up a thousand barriers round him, to obviate the deleterious

effects of climate on his constitution; while the poor animal, tied down by instinct to a few simple modes of life, is quite defenceless. Nature must do all for the latter; and, in fact it is evident that this indulgent mother does compensate, in some degree, for the want of reason, by producing such corporeal changes, as are necessary for the animal's subsistence under a foreign sky, in a *shorter* space of time, than is necessary for effecting correspondent changes in man. One example may suffice. The tender and innocent sheep, when transported from the inelemency of the north to pant under a vertical sun on the equator, will, in a few generations, exehange its warm fleeeee of *wool*, for a much more convenient coat of *hair*. "Can the Ethiopian change his hue," in the same period, by shifting his habitation from the interior of Africa to the shores of the Baltie? Or will it be said, that the fair complexion of Europeans, may, in two or three generations, aquire the sable tinct of the inter-tropical natives, by exehanging situations? Assuredly not. Where then is the superior pliancy of the human constitution? The truth is, that the tender frame of man is ineapable of sustaining that degree of exposure to the whole range of causes and effects incident to, or arising from vieissitude of climate, whieh so speedily operates a change in the structure, or, at least, the exterior, of unprotected animals.

But it is observed, that of those animals translated from a temperate to a torrid zone, "many die suddenly, others droop, and all degenerate." This is not to be

wondered at, considering the disadvantages under which they labour. Man would not fare better, if placed in similar circumstances. Even as it is, the parallel is not far from applying. Of those Europeans who arrive on the banks of the Ganges, many fall early victims to the climate, as will be shewn hereafter. That others droop, and are forced, in a very few years, to seek their native air, is also well known. And that the successors of all would gradually degenerate, if they remained permanently in the country, cannot easily be disproved; while a very striking instance, corroborative of the supposition, may be here adduced.

Whoever has attentively examined the posterity of De Gama, and Albuquerque, now scattered over the coast of Malabar, the plains of Bengal, and the Island of Macao, once the theatres of Lusitanian pre-eminence, will be tempted to exclaim:—

'Twas not the sires of such as these,
Who dared the elements and pathless seas;
Who made proud Asian monarchs feel
How weak their gold was against Europe's stéel.
But beings of *another mould*,—
Rough, hardy, vigorous, manly, bold!

In answer to this it will be alleged, "that they have married and blended with the natives until all shade of distinction is obliterated." But it is well known to those who have resided long in India, that the two great prevailing classes of society in that country, the Hindoos

and Mahomedans hold these descendants of the Portuguese in the most marked and sovereign contempt ; while the latter, still retaining a remnant of the religion, and all the prejudice of their progenitors, entertain an equal abhorrence of their idolatrous and infidel neighbours. This being the case, we may fairly presume, that the intermixture has been much less extensive than is generally supposed; an inference strongly supported, if not confirmed, by the well known fact, that, while the people in question have forfeited all pretensions to the European *complexion*, their more stubborn features still evince a descent, and establish their claim to an ancestry, of which they are superlatively proud. Let those who deny *one common origin* of mankind, and that climate is the *sole cause* of complexion, explain this phenomenon if they can.

On the other hand, if we look at inter-tropical natives approaching our own latitudes, the picture is not more cheering. The African children brought over by the Sierra Leone Company for education, seldom survived the third year in this country. "They bear the first winter, (says Dr. Pearson) tolerably well, but droop during the second, and the third generally proves fatal to them."

The object of these remarks, which, at first sight, might seem irrelevant, will now appear. Since it is evident that nature does not operate more powerfully in counteracting the ill effects of climate on man, than on other animals, it follows that we should not implicitly

confide, as too many do, in the spontaneous efforts of the constitution, but on the contrary, call in to its aid, those artificial means of prevention and melioration, which reason may dictate and experience confirm. In short, that we should, as my motto expresses it:—

—————“Study well the clime,
Mould to its manners our obsequious frames,
And mitigate those ills we cannot shun.”—

That these salutary precautions are too often despised or neglected, a single quotation from a gentleman, who has resided more than twenty years in India, and whose talent for observation is, in my opinion, unequalled, will put beyond a doubt. “Nothing can be more preposterous (says Capt. Williamson,*) than the significant sneers of gentlemen on their first arrival in India; meaning thereby to ridicule, or to despise what they consider effeminacy or luxury. Thus several may be seen walking about without chattahs (i. e. umbrellas) during the greatest heats. They affect to be ashamed of requiring aid, and endeavour to uphold, by such a display of indifference, the great reliance placed on *strength of constitution*. This unhappy infatuation rarely exceeds a few days: at the end of that time, we are too often called upon to attend the funeral of the self-deluded victim.†”

It shall be my endeavor in this essay, after tracing the

*Author of “Oriental Field Sports,” “East India Vade Mecum,” &c.

†*East India Vade Mecum*, vol 2. page ii.

causes, and portraying the effects of tropical diseases, in such a manner as must impress the most heedless European with the necessity of circumspection on approaching the scene of danger, to furnish a code of instructions deduced from principle and experience, that cannot fail to prove a useful companion to every one who regards health as the grand source of happiness, and the most invaluable blessing which heaven can bestow. Many a day's anxiety and personal suffering should I have escaped, had I been furnished with so friendly a monitor !

Without any very fastidious regard to arrangement it, will still be necessary, for the sake of perspicuity, to observe some order. I shall therefore divide the subject into three principal heads, viz:—

1.—The Primary or General Effects of a Tropical Climate on the European Constitution.

2.—The Specific or Actual Diseases.

3.—Prophylaxis; or the Means of Counteracting the Influence of Climate, and Preserving Health.

PART I.

PRIMARY OR GENERAL EFFECTS.

UNDER this head, I shall consider some of those gradual and progressive changes in the constitution, and deviations from previous health and habits, which, though pre-disposing, and verging, as it were, towards, yet fall short of actual disease.

These are consequences which all must expect, more or less, to feel, on leaving their native soil, and, of course, in which all are directly interested. For although a few individuals may occasionally return from even a long residence in hot climates, without having suffered any violent illness, or much deterioration of constitution, yet the great mass of Europeans will certainly experience the effects developed under this head, and many others of minor consequence, which will be taken notice of in different parts of the work.

It is, however, by the most scrupulous attention to these *incipient deviations from health*, by early arresting their growth, or at least retarding, as much as possible, their progress, that we can at all expect to evade those dangerous diseases, to which they inevitably, though often imperceptibly, tend.

Sec. 1.—The transition from a climate, whose medium heat is 52°. of Fahrenheit, to one where the thermometer ranges from 80°. to 100°. and sometimes higher, might be supposed, *a priori*, to occasion the most serious consequences. Indeed, the celebrated Boerhaave, from some experiments on animals, concluded, that the *blood would coagulate in our veins*, at a temperature very little exceeding 100°. More modern trials, however, have proved that the human frame can bear, for a short time at least, more than double the above degree of atmospherical heat, and that too without greatly increasing the natural temperature of the body.

The benevolent Author of our existence has endowed man, as well as other animals, with the power not only of generating heat, and preserving their temperature, in the coldest regions of the earth; but has also provided an apparatus for carrying off any superabundance of it that might accumulate where the temperature of the atmosphere approaches to or exceeds that of the body. With the *former* process, which is supposed to be carried on in the lungs, we have, at present, nothing to do; the *latter* is one which deserves great attention, and which will meet with ample consideration in various parts of this essay.

We are no sooner beneath a vertical sun, than we begin, as may naturally be supposed, to experience the disagreeable sensation of unaccustomed warmth; and as the temperature of the atmosphere, even in the

shade, now advances within ten or twelve degrees to that of the blood, and in the sun, very generally exceeds it, the heat perpetually generated in the body, cannot be so rapidly abstracted, as hitherto, by the surrounding air, and would, of course, soon accumulate so as to destroy the functions of life itself, did not Nature immediately open the sluices of the skin, and by a flow of *perspiration*, reduce the temperature of the body to its original standard.

Whether the superabundant animal heat combines with the perspirable fluid, and thus escapes ; or whether the refrigeration takes place on the principle of evaporation, is more a matter of speculation than practical importance to ascertain. We know the fact, that perspiration is a cooling process. The modus operandi—

"Let sages versed in Nature's lore explain."

When we contemplate this admirable provision of nature, against what might appear to us an unforeseen event ; when we survey the resources and expedients which she can command on all emergencies—her power of supplying every waste, and restraining every aberration of the constitution, we would be almost tempted to conclude, that man was calculated for immortality ! But, alas !

"There is a point,
"By nature fixed, whence life must downward tend,"

'Till at length, this wonderful machine, exhausted

by its own efforts at preservation, and deserted by its immaterial tenant, sinks, and is resolved into its constituent elements !

Nascentes morimur, finisque ab origine pendet.

But, to return. We must not conclude that this refrigerating process, adopted by nature to prevent more serious mischief, is, in itself, unproductive of any detriment to the constitution—far otherwise. “ If (says Dr. Currie) the orifices do *not* pour out a proportionate quantity of perspiration, aside se must ensue from the direct stimulus of heat ; and if the *necessary* quantity of perspiration takes place, the system is *enfeebled* by the evacuation*.”

Here, then, we have Scylla on one side, and Charybdis on the other : morbid accumulation of heat if we do not perspire enough—debility if we do. How are we to direct our course through this intricate and dangerous navigation ?

Dr. CURRIE.

“ Europeans who go to the West Indies are more healthy, in proportion, as they perspire freely, especially if they support the discharge by a moderate use of gently stimulating liquids, stopping short of intoxication.”—ib.

* Medical Reports, vol. 1, p. 278.

Dr. MOSELEY.

"I aver from my own knowledge and custom, as well as from the custom and observations of others, that those who drink *nothing but water*, are but little affected by the climate, and can undergo the greatest fatigue without inconvenience."—*Tropical Diseases*, p. 57.

Who shall decide when Doctors disagree?

Without meaning to set up the judgment of a Moseley in competition with that of a Currie, on other subjects, candour obliges me to confirm, by personal observation and experience, the truth of Dr. Moseley's remark. Dr. Currie never was in a tropical climate, therefore had the above piece of information from others ; and it is one of the very few erroneous positions in his invaluable work. Nevertheless, these apparently opposite directions, are not so contradictory in *fact* as in *terms*. The principle on which both act, is the same, though the means are different. Dr. Currie's plan of supplying the stomach with "gently stimulating liquids," will undoubtedly keep the morbid heat from accumulating, by driving out a copious perspiration ; but it will, at the same time, lead to debility, by carrying off much more of that fluid than is necessary ; by which means the thirst, instead of being allayed, will be increased ; and what is still worse, the body will be rendered more susceptible of the subsequent impressions of cold, the deleterious effects of which, at these

times, are much more extensive than is generally believed, as will be shewn in another part of the work.

Dr. Moseley's plan, on the other hand, far from preventing perspiration, will be found, in general, to promote it, but at the same time restrain its *excess*.—A familiar example or two will elucidate this subject.

We will suppose two gentlemen to be sitting in a room, at Madras, or in Jamaica, just before the sea-breeze sets in, both complaining of thirst, their skin hot, and the temperature of their bodies 100° , or two degrees above the natural standard.

One of them, pursuant to Dr. Currie's instructions, applies to the sangaree bowl, or porter cup, and after a draught or two, brings out a copious perspiration, which soon reduces the temperature to 98° . It will not stop here, however, nor indeed will the gentleman, according to the plan proposed ; for instead of putting the bulb of the thermometer under his tongue, to see if the mercury is low enough, he, feeling his thirst increased by the perspiration, very naturally prefers a glass or two more of the sangaree—"to support the discharge"—still, however, "stopping short of intoxication." Now, by these means, the temperature is reduced to 97° . or 96° , in which state, even the slight, and otherwise refreshing chill of the sea-breeze, checks more or less the cuticular discharge, and paves the way for future maladies.

Whether this is, or is not, a true representation of the case, let Dr. Currie's own words decide.

"If" says he, ut supra, "the necessary quantity of perspiration takes place, (viz. by the use of gently stimulating liquids,) the system is enfeebled by the evacuation, and the extreme vessels losing tone *continue* to transmit the perspirable matter, *after* the heat is reduced to its natural standard, or, perhaps, *lower*; in which situation, we can easily suppose that even a slight degree of external cold, may become dangerous."

—Vol. I. p. 278.

Let us now turn to the other gentleman, who pursues a different line of conduct. Instead of the more palatable potion of sangaree, he takes a draught of plain cold water. This is hardly swallowed before the temperature of his body loses by abstraction alone, one degree, at least, of its heat. It is now, we will suppose, at 99° . But the external surface of the body immediately sympathising with the internal surface of the stomach, relaxes, and a *mild* perspiration breaks out, which reduces the temperature to its natural standard, 98° . Farther, this simultaneous relaxation of the two surfaces, completely removes the disagreeable sensation of thirst; and, as the simple "antedeluvian beverage" does not possess many Circean charms for modern palates, there will not be the slightest danger of its being abused in quantity, or the perspiratory process carried beyond its salutary limits. Nor need we, on the other hand, apprehend its being neglected; since, from the moment that the skin begins to be con-

stricted, or morbid heat to accumulate, the sympathising stomach and fauces will not fail to warn us of our danger, by craving the proper remedy. Taken therefore as a general rule, the advantages of the *latter* plan are numerous—the objections few. It possesses all the requisites of the *former*, in procuring a reduction of temperature, (the only legitimate object which the admirers of sangaree and copious perspiration can have in view) without any danger of bringing it below the proper level, or wasting the strength, by the profuseness of the discharge.

It is true, there is no general rule without exception; and there may be instances, wherein the use of “gently stimulating liquids” is preferable to that of cold drink.

For example:—during, or subsequent to violent exertion, under a powerful sun; or in any other situation in a tropical climate, when profuse perspiration is rapidly carrying off the animal heat, and especially when fatigue or exhaustion has taken place, or is impending—then cold drink would be dangerous, on the same principle as external cold. But these cases rarely happen through *necessity*, to Europeans, particularly in the East; and they will be duly considered in the prophylactic part of this essay.

I have been more prolix on this point, than may have seemed necessary to the medical reader; but considering that this is generally the first erroneous step which Europeans take, on entering the tropics, and

that the function in question (perspiration) is more intimately connected with another very important one in the human frame, than is commonly supposed ; I thought it proper to set them right, *in limine*. The probability of *future suffering* will rarely deter the European from indulging in *present gratifications* ; but where these last, *i. e.* the stimulating liquids, are represented, from high authority, as not only innocent but salutary, it will require some strength of argument to persuade young men to relinquish their use, or to check the wide-spreading evil.

Sect. 2.—In attempting to delineate the influence of hot climates on the European constitution, although we may endeavour—

“ To chain the events in regular array ;”

yet, it must be confessed, that nature spurns all such artificial arrangements ; since simultaneous impressions on several organs, must produce co-temporary and combined effects, which our limited faculties are scarcely capable of embracing in thought, much less, of describing in the fetters of language.

Taking facts, however, and personal observation for land-marks, I shall pursue the investigation, as nearly as possible, in the order of nature and of events.

There exists between different, and often distant parts of the body, a certain connection or relation, which, in medical language, is called “consent of parts :”—that is, when *one* is affected by particular

impressions, the *other* sympathises, as it were, and takes on a kind of analogous action.

This sympathy, or consent of parts, has never been satisfactorily accounted for, by the ablest of our physiologists, nor—(mirabile dictu !) by the most ingenious of our theorists. As all, however, are agreed in respect to the *fact*, we may allow the *cause* to remain locked up in nature's strong box, in company with many other arcana, which she does not seem disposed to reveal.*

Of these sympathics, none is more universally remarked, or familiarly known, than that which subsists between the *external* surface of the body, and the *internal* surface of the alimentary canal. This, indeed, seems less incomprehensible than many others, since the *latter* appears to be a continuation of the *former*, with the exception of the cuticle. In the first section, I gave an instance of the skin sympathising with the stomach, where the cold drink was applied to the latter organ. Had the water been applied to the external surface of the body, on the other hand, the stomach would have sympathised, and the thirst been assuaged.

The loss of tone, then, in the extreme vessels of the surface, in consequence of excessive, or long continued perspiration is, on this principle, necessarily accompanied, or soon succeeded by a spontaneous loss of tone in the stomach, and fully accounts for that

* I do not see that Dr. Park's laboured discussion on this subject, in the Journal of Science, has brought us a whit nearer the knowledge of sympathetic action.

anorexia, or diminution of appetite, which we seldom fail to experience on entering the tropics, or, indeed, during hot weather in England. Now this, although but a link in the chain of effects, seems to me a most wise precaution of nature, to lower and adapt the irritable, plethoric European constitution, to a burning climate, by guarding very effectually against the dangerous consequences of repletion. This view of the subject will set in a clear light, the pernicious effects of stimulating liquids, operating on an organ already debilitated (probably for salutary purposes,) and goading it thereby to exertions beyond its natural power, producing a temporary plethora, with a great increase of subsequent atony.

A remark, which every person of observation must have made, even in this country, during the summer, but particularly in equatorial regions, will farther elucidate this subject. If by walking, for instance, or any other bodily exercise, in the heat of the sun, during the forenoon, especially near dinner hour, the perspiration be much increased, and the extreme vessels relaxed, we find, on sitting down to table, our appetites entirely gone, until we take a glass of wine, or other stimulating fluid, to excite the energy of the stomach. Under such circumstances of artificial or forced relish for food, it is not to be wondered at, that the digestion should be incomplete, and that the intestines should suffer from the passage of badly concocted aliment. Observation and personal feeling have taught me this,—

that in hot climates, perhaps during hot weather in all climates, an hour's cool repose before dinner is highly salutary; and if on commencing our repast, we find we cannot eat without *drinking*, we may be assured that it is nature's caveat,—to beware of eating at all. This will be deemed hard doctrine by some, and visionary by others; but I know it is neither one nor the other: and those who shall neglect or despise it, may feel the bad consequences, when it is too late to repair the error.

There are several other causes, however, which operate in conjunction with the above, to impair the appetite:—one of which is, the want of rest at night. After disturbed and unrefreshing sleep, (but too common in tropical climates) the whole frame languishes next day, and the stomach participates in the general relaxation. The means of managing and obviating these effects, will be pointed out in the prophylactic part of this essay.

Sec. 3. We now take a wider range, and come to a subject more intricate in its nature, extensive in its bearings, and important in its consequences. It will readily be understood, that I allude to the influence of a tropical climate on the liver and its functions.

This immense gland is the largest organ in the human frame; for neither the brain, heart, spleen, nor kidneys, can be at all compared with it; and the lungs, though occupying a larger extent when inflated, yet if

condensed to equal solidity, would fall short in size and weight.

Now, since nature, throughout her works, has seldom been accused of supererogation, we may safely conclude that the importance of this organ's function, in the animal economy, is commensurate with its magnitude. The structure of the liver has been explored by the anatomist, and the bile secreted in it, analysed. But, although the chymist has separated this fluid into its constituent parts ; yet physiologists are not exactly agreed in regard to the purposes which it answers in the system. It is proved to be antiputrescent, and in conjunction with the pancreatic juice, it probably assists in animalising and eliminating the chyle from the chyme.

It is supposed not to enter the circulation naturally, at least in an unchanged state along with the chyle : but, there can be little doubt of its preventing the putrefactive or fermentative process from taking place in the excrementitious part, which is, ultimately, to be expelled the body. Another, and a principal use of this important fluid, appears to consist in stimulating the intestines into their peculiar peristaltic motion, and thus propelling their contents continually forward, to give the lacteals an opportunity of drinking up and conveying to the blood the nourishment by which our frames are supported.

In this point of view, it is the natural tonic of the intestines, and also the purgative which frees them

from all fecal matter, the retention of which is productive of so much inconvenience, not to say disease.

The first effect of a tropical climate on the function of the liver, is universally allowed to be an *increase* of the biliary secretion. This is so evident in our own country, where the summer and autumn are distinguished by diseases arising from super-abundant secretion of bile, that it would be waste of time to adduce any arguments in proof of the assertion. But why an increase of the atmospherical temperature should so invariably augment the hepatic secretion in all climates, and all classes of people, is totally unaccounted for. When Dr. Saunders conjectures that richness of blood, tenseness of fibre, grossness of diet, and rapidity of circulation, are the causes of Europeans being at first more afflicted with bilious redundancy in India than the native Hindoos, he gives us only a *comparative* view of things, and leaves us completely in the dark with respect to the *modus operandi* of heat, as a general and universal spur on the secretory vessels of the liver.

Were this a question of mere curiosity, or theoretical speculation, I should pass it by unnoticed ; but from long and attentive observation, as well as mature reflection, I believe that I have discovered a connection between two important functions in the animal economy, which will let in some light on this subject, and lead to practical inferences of considerable importance.

The arguments and facts adduced in support of this connection will be found under the heads Hepatitis,

Dysentery, and in other parts of this essay. In the meanwhile, I shall merely state in a few words the result of my observations, leaving the reader to give credit to it, or not, as he may feel inclined.

There exists then between the extreme vessels of the vena portarum in the liver, and the extreme vessels on the surface of the body—in other words, between *biliary secretion and perspiration*, one of the strongest sympathies in the human frame; although entirely unnoticed hitherto, as far as I am acquainted. That these two functions are regularly, and to appearance, equally increased, or at least influenced by *one* particular agent (atmospherical heat) from the cradle to the grave—from the pole to the equator, will be readily granted by every observer: and that this *synchronous action* alone, independent of any other original connection, should soon grow up into a powerful sympathy, manifesting itself when *either* of these functions, came under the influence of *other agents*, is a legitimate conclusion in theory, and what I hope to prove by a fair appeal to facts. This last consideration is the great practical one; for it is of little consequence whether this sympathy was originally implanted by the hand of nature at our first formation, or sprung up gradually in the manner alluded to, provided we know that it actually exists, and that by directing our operations towards any *one* of the functions in question, we can decisively influence the *other*. This is what I maintain; but here I only offer assertions; in a future part of the work I

shall bring forward facts and cogent arguments in proof of them. At present let this "consent of parts" between the skin and the liver, which I shall beg leave to denominate the "*Cutaneo-hepatic Sympathy*," account for the augmented secretion of bile, which we observe on arriving in hot climates, corresponding to the increased cuticular discharge. I shall here offer one practical remark, resulting from this view of the subject, and which will be found deserving of every European's attention on his emigration to Southern regions. Namely, that as the state of the perspiratory process is a visible and certain index to that of the biliary, so every precautionary measure, which keeps in check, or moderates the profusion of the *former* discharge, will invariably have the same effect on the *latter*, and thus tend to obviate the inconvenience, not to say the disorders, arising from redundancy of the hepatic secretion. To this rule I do not know a single exception; consequently its universal application can never lead astray in any instance. But this subject will be better elucidated, and more clearly explained hereafter.

To proceed. It is well known, without having recourse to Brunonian doctrines, that if any organ be stimulated to *inordinate* action, one of two things must in general ensue. If the cause applied, be constant, and sufficient to keep up, for any length of time, this *inordinate* action, serious injury is likely to accrue to the organ itself, even so far as *structural* alteration. But if the cause be only temporary, or the force not in any

great degree, then an occasional torpor, or exhaustion, as it were, of the organ, takes place, during which period its *function* falls short of the natural range. To give a familiar example, of which too many of us are quite competent to judge:—thus, if the stomach be goaded to immoderate exertion to-day, by a provocative variety of savoury dishes and stimulating liquors, we all know the atony which will succeed to-morrow, and how incapable it then will be of performing its accustomed office. It is the same with respect to the liver. After great excitement, by excessive heat, violent exercise in the sun, &c. a torpor succeeds, which will be more or less, according to the degree of previous excitement, and the length of time which the stimulating causes have been habitually applied. For instance, when Europeans first arrive between the tropics, the degree of torpor bears so small a proportion to that of preceding excitement, in the liver, that it is scarcely noticed; particularly as the debilitated vessels in this organ, *continue* (similar to the perspiratory vessels on the surface) to secrete a depraved fluid for some time *after* the exciting cause had ceased; hence the *increase* of the biliary secretion occupies our principal attention. But these torpid periods, however short, at first, gradually and progressively increase, till at length they far exceed the periods of excitement; and then a *deficiency* of the biliary secretion becomes evident. This is not only consonant to experience, but to analogy. Thus when a man first betakes himself to inebriety, the ex-

citement occasioned by spirits, or wine, on the stomach and nervous system, far exceeds the subsequent atony, and we are astonished to see him go on for some time without, apparently, suffering much detriment in his constitution. But the period of excitement is gradually curtailed, while that of atony increases, which soon forces him not only to augment the dose, but to repeat it oftener and oftener, till the organ and life are destroyed!

Now it is somewhat singular, that this alternation of redundancy and deficiency, or in other words, *irregular* secretion in the biliary organ, should pass unnoticed by writers on hot climates. They, one and all, represent the liver as a colossal apparatus, of the most Herculean power, that goes on for years, performing prodigies in the secreting way, without ever being exhausted for a moment, or falling *below* the range of ordinary action, till structural derangement, such as scirrhosity, incapacitates it for its duty!

A very attentive observation of what passed in my own frame, and those of others, has led me to form a very different conclusion, and the foregoing statement will, I think, be found a true and natural representation of the case. I shall afterwards shew, that the secretion in question is frequently *below par*, in quantity, at the very time when it is considered to be redundant—all arising from irregularity and vitiation.

Here then, we have two very opposite states of the liver and its functions. 1st, inordinate action, with

increased secretion—the periods generally shortening. 2nd, Torpor of the vessels in the liver, with deficient secretion—the periods progressively lengthening. In both cases, the bile itself is *vitiated*.

We may readily enough conceive how this last comes to pass, by an analogical comparison with what takes place in the stomach during, and subject to, a debauch. In both instances, we may conclude, that the chyme passes through the pylorus into the duodenum, in a state less fit for chylification, than during a season of temperance and regularity. So, during the increased secretion, and subsequent inactivity in the liver, the bile passes out into the intestines deteriorated in quality, as well as superabundant or deficient in quantity.

In what this vitiation consists, it is certainly not easy to say. In high degrees of it, attendant on hurried secretion, both the colour and taste are surprisingly altered; since it occasionally assumes all the shades between a deep bottle green and jet black; possessing, at one time, an acidity that sets the teeth on edge; at other times, and indeed, more frequently, an acrimony that seems absolutely to corrode the stomach and fauces, as it passes off by vomiting, and when directed downwards, can be compared to nothing more appropriate than the sensation which one would expect from boiling lead flowing through the intestines. Many a time have I experienced this, and many a time have my patients ex-

pressed themselves in similar language. But these are extremes that will be considered under Cholera Morbus, Bilious Fever, Dysentery, &c. The slightly disordered state of the hepatic functions, which we are now considering as primary effects of climate, and within the range of health, may be known by the following symptoms:—Irregularity in the bowels; general languor of body and mind; slight nausea, especially in the mornings, when we attempt to brush our teeth; a yellowish fur about the back part of the tongue; unpleasant taste in the mouth, on getting out of bed; a tinge in the eyes and complexion, from absorption of bile; the urine high coloured, and a slight irritation in passing it; the appetite impaired, and easily turned against fat or oily victuals. These are the first effects, then, of increased and irregular secretion of bile, and will appear in all degrees, according as we are less or more cautious in avoiding the numerous causes that give additional force to the influence of climate. For example: if I use more than ordinary exercise—expose myself to the heat of the sun—or drink stimulating liquids today, an increased and vitiated flow of bile takes place, and to-morrow produces either nausea and sickness at the stomach, or a diarrhoea, with gripings and twitchings in my bowels. But a slight degree of inaction or torpor succeeding, both in the liver and intestines, there will probably be no alvine evacuation at all, the ensuing day, till a fresh flow of bile sets all in motion once more. These irregularities, although they may

continue a long time without producing much inconvenience, especially if they be not aggravated by excesses, yet they should never be despised, since they inevitably, though insensibly, pave the way for serious derangement in the biliary and digestive organs, unless counteracted by the most rigid temperance, and the prophylactic measures which I shall carefully detail in their place. The reciprocal influence and effects which the hepatic and mental functions exercise on each other, will form an interesting inquiry, under the article Hepatitis.

Sec. 4.—Among the primary effects of a hot climate (for it can hardly be called a disease) we may notice the prickly heat (*Lichen tropicus*) a very troublesome visitor, which few Europeans escape.

This is one of the miseries of a tropical life, and a most unmanageable one it is. From mosquitoes, cockroaches, ants, and the numerous other tribes of depredators on our *personal* property, we have some defence by night, and, in general, a respite by day; but this unwelcome guest assails us at all, and particularly the most unseasonable hours. Many a time have I been forecd to spring from table and abandon the repast, which I had scarcely touched, to writhe about in the open air, for a quarter of an hour: and often have I returned to the charge, with no better success, against my ignoble opponent! The night affords no asylum. For some weeks after arriving in India, I seldom could obtain more

than an hour's sleep at one time, before I was compelled to quit my couch, with no small precipitation, and if there were any water at hand, to sluice it over me, for the purpose of allaying the inexpressible irritation! But this was productive of temporary relief only; and what was worse, a more violent paroxysm frequently succeeded.

The sensations arising from prickly heat are perfectly indescribable; being compounded of pricking, itching, tingling, and many other feelings, for which I have no appropriate appellation.

It is usually, but not invariably accompanied by an eruption of vivid, red pimples, not larger in general, than a pin's head, which spread over the breast, arms, thighs, neck, and occasionally along the forehead, close to the hair. This eruption often disappears, in a great measure, when we are sitting quiet, and the skin is cool; but no sooner do we use any exercise that brings out a perspiration, or swallow any warm, or stimulating fluid, such as tea, soup, or wine, than the pimples become elevated, so as to be very distinctly seen, and but too sensibly felt!

Prickly heat, being merely a symptom, not a cause of good health, its disappearance has been erroneously accused of producing much mischief; hence, the early writers on tropical diseases, harping on the old string of "humoral pathology," speak very seriously of the danger of *repelling*, and the advantage of "encouraging the

eruption, by taking small warm liquors, as tea, coffee, wine, whey, broth, and nourishing meats.”—*Hillary.*

Even Dr. Moseley retails the puerile and exaggerated dangers of his predecessor. “There is great danger” (says he) “in repelling the prickly heat; therefore cold bathing, and washing the body with cold water, at the time it is out, is always to be avoided.” Every naval surgeon, however, who has been a few months in a hot climate, must have seen hundreds, if not thousands, plunging into the water, for days and weeks in succession, covered with prickly heat, yet without bad consequences ensuing.

Indeed, I never saw it even repelled by the cold bath; and in my own case, as well as in many others, it rather seemed to aggravate the eruption and disagreeable sensations, especially during the glow which succeeded the immersion. It certainly disappears suddenly sometimes on the *accession* of other diseases, but I never had reason to suppose, that its disappearance *occurred* them. I have tried lime juice, hair powder, and a variety of external applications, with little or no benefit. In short, the only means, which I ever saw productive of any good effect in mitigating its violence, till the constitution got assimilated to the climate, were—light clothing—temperance in eating and drinking—avoiding all exercise in the heat of the day—open bowels—and last, not least, a determined resolution to resist with stoical apathy its first attacks. To sit quiet and unmoved under its pressure is undoubtedly no easy task,

but if we can only muster up fortitude enough to bear with patience the first few minutes of the assault, without being roused into motion, the enemy, like the foiled tiger, will generally sneak off, and leave us victorious for the time.

PART II.

SPECIFIC DISEASES.

Eastern Hemisphere.

Sec. 1.—Fever in General.—It is not my intention to include in this section what is called *Symptomatic fevers*. It is to the subject of **FEVER**, strictly so called, that I shall confine my observations ; and trite and exhausted as the theme may appear, I hope still to render it, in some measure, interesting. If I have omitted the adjective “*idiopathic*” it is not because I consider fever as in all cases dependent on topical inflammation or congestion ; but because I wish to avoid a “war of words” about an abstract term. Some late writings, and particularly Dr. Clutterbuck’s Essay, have divided the medical world in opinion, a very considerable portion subscribing to the Doctor’s theory. There is still, however, as far as I can learn, a majority in favour of the old doctrine that fever may originate, and even proceed some way in its course, without local inflammation—or those topical affections which

may be considered analogous to, or synonymous with local inflammation.

Contrary to the usual mode of proceeding, before entering on the nature of fever itself, I shall take a rapid survey of the *causes* of this wonderful disease. By systematic writers these have been divided into remote and proximate ; but the latter being the actual *state* of the disease, will not yet come under consideration. The remote causes are subdivided into predisponent and exciting. The predisponent, however, often become the exciting, and the exciting the predisponent causes, as the following example will illustrate. Two labourers set out from London, in the summer or autumn, to work in the fens in Lincolnshire. The one is a sober man, the other a drunkard. The latter is attacked with intermittent fever, while the former, though equally exposed, escapes. Here inebriety is evidently the predisposing, and marsh miasma the exciting cause of the disease. But the sober man having returned to London in the winter, commits a debauch, and immediately afterwards he is seized with ague. Here, on the other hand, the latent miasma becomes the predisposing, and drunkenness the exciting cause of the fever. Let this be borne in mind, for it may help to explain more than at first sight might be expected.

Speaking generally, however, the two great exciting causes of fever are human and marsh effluvia ; while the predisposing causes are almost innumerable. The more prominent, however, are, plethora—inanition from ex-

cessive evacuations—the depressing passions—excess, whether in eating, drinking, gratification of the sensual passions—mental or corporeal exertions—extremes of atmospheric heat and cold, especially alternations of these or of heat and moisture—sollunar influence.

Now experience has determined, that of the foregoing and many other predisponent causes, any *one* (excepting the last,) will, when in a very high degree, induce fever without the assistance of any other. If this be the case, then, it is a natural and just inference that the operation of marsh and human effluvium on the human frame bears a very considerable analogy to the operation of those causes enumerated as generally *predisposing* to, but sometimes actually *exciting* fever. This may give us a clue to assist in unravelling the *ratio symptomatum* hereafter; but before entering on the effects, we shall say something of the causes themselves.

Human Effluvium or Contagion.—The existence of this febrile miasm as the cause of fever does not appear to have been known to the ancients, since Hippocrates makes no mention of it, and the strict prohibitions against *contact* with unclean or diseased persons recorded in the Mosaic code, do not seem directed against febrile, but chronic or local infection—probably against cutaneous or genital defædations. It is curious, however, that Pliny, when describing the progress of an *endemic* fever, apparently solves a question which to this moment, gives rise to the most violent altercations—namely, whether *endemic* fevers ever become

contagious? "Et primo temporis ac loci vitio, et ægri
rant, et moriebantur; postea, curatio ipsa et contactus
ægrorum vulgabat morbos." Lib. xxv. ch. 26. But
more of this hereafter.

Notwithstanding the exertions of Dr. Bancroft and
some others to invalidate certain testimonies respecting
the generation of contagious effluvium, facts too stub-
born to be swept away by the brush of sophistry at-
test that the effluvium issuing from the bodies of a num-
ber of human beings confined too closely, whether in
a state of health or disease, will occasionally produce
a contagion which is capable not only of exciting fever
among those so confined, but of propagating itself af-
terwards from them to others.

Setting aside the testimonies of Bacon, Lind, Pringle,
and others, the transports which received and convey-
ed home the wretched remnant of Sir John Moore's
army, after the battle of Corunna, afforded the most
decisive and melancholy proofs that bodies of men con-
fined close together between the decks of a ship in
stormy weather, will soon become sickly, and that their
diseases may be communicated to nurses and others,
after they are landed, washed, and placed in the most
clean and airy hospitals. It will hardly be contended
that these men could have carried any infection on board,
either in their persons or clothes, after a rapid retreat,
during which, almost every stitch of garment was
washed from their backs by the incessant rains. A
dreadful and sanguinary battle at the water's edge, gave

them no time to contract infection or even clothe themselves at Corunna. They precipitated themselves tumultuously, naked, exhausted, and wounded, into the first vessels that came in their way, and were there crowded from choice or necessity during a cold, wet, and tempestuous passage across the Bay of Biscay. On this passage a most fatal typhoid fever broke out, which spread far and wide among the nurses and medical attendants of the hospitals in England where they were landed. They embarked indeed with an unusual degree of predisposition to disease, arising from excessive fatigue—chagrin—exposure to the elements by day and night—nakedness—want—occasional inebriety—insubordination; and last of all—exhaustion after a tremendous conflict that closed this disastrous retreat. It was utterly impossible, however, that a particle of fomites or the matter of contagion could exist among them at the moment of their embarkation ; and it was too fatally proved that every transport exhibited a most destructive focus of infectious fever before they reached England I have dwelt the longer on this point, because it bears upon questions that are now agitating the public mind ; and because Time's telescope cannot be inverted here as it has been on other occasions, nor facts be denied that are so recent in the memory of thousands now alive. Within a few yards of the spot where I now write, the greater part of a family fell sacrifices to the effects of fomites that lurked in a blanket pur-

chased from one of these soldiers after their return from Corunna !

It is not so well ascertained that the effluvia from *dead* animal matters *alone* will generate a contagious disease ; at least it has been fashionable to deny such an occurrence since Dr. Bancroft's publication. But there are not wanting respectable testimonies in the affirmative ; and it does not seem very incredible that offensive exhalations from large masses of putrifying animal matters should, under certain circumstances, produce fever, as related by Forestus and Senac. The late fatal fever at Cambridge appears to have been of local origin at first, but propagated by infection afterwards.

Of what this contagious matter consists, we are totally ignorant, as it is perfectly incognizable by the senses, and incapable of being submitted to the chemical analysis. Many people have declared that they felt an indescribable taste in their mouths, and sensation over their frames, together with a peculiar odour impressed on their olfactories, at the moment of imbibing the poison ; but it cannot be ascertained whether these were produced by the contagion itself, or by any effluvium accompanying or conveying it.

With the laws which govern contagion, we are fortunately better acquainted. It does not appear to be much under the control of the seasons, since a full dose of it will produce the specific effect at any time of the year. As warm air causes a greater exhalation from bodies, it

might, *a priori*, have been expected that this contagion would spread most in the summer; and the popular opinion to this day is, that hot weather is prejudicial to patients labouring under typhoid fevers. We find, however, that it is in winter that these diseases are most prevalent. The reason appears to be simply this:—the freer ventilation of summer dilutes and dissipates the exhalations from the sick, rendering them innocuous; while the confined air of small apartments among the poor, in winter, tends to condense, as it were, the febrifacient effluvia, and embue the bedding, &c. of the sick with the same; forming a fruitful source for the dissemination of the disease by means of *fomites*, a form in which the matter of contagion is eminently powerful. Experiments have proved that this contagion, when diluted with pure atmospheric air, becomes harmless at the distance of a few yards—perhaps of a few feet; and hence the surest means of preventing its dissemination are, cleanliness and ventilation. Indeed it is only where these *cannot* be procured, that the *juggling* process of fumigation need ever be resorted to; and I firmly believe that if the latter ever checked the spread of contagion, it was more by its effects on *mind* than on *matter*. The history of animal magnetism alone will teach us how far imagination may go in actually arresting the progress of disease in its full career; and in no case have *mental* impressions more decided effects than in checking or facilitating the operation of contagion on the human body.

The next thing to be observed is, that from idiosyncrasy of constitution, some individuals are infinitely less susceptible of the contagion than others ; and also, that habitual exposure to it, renders us more capable of resisting it, as is exemplified among nurses and medical men. This circumstance appears explicable on the principle of *habit* which renders us able to bear a larger dose of any other poison, as of arsenic, opium, &c. Dr. Haygarth affirms that he has been in the *habit* of breathing, *almost daily*, air strongly impregnated with the infectious miasms of fever, during a space of more than 50 years, and yet never but once caught a fever in all that time. Some periods of life, however, render the body more susceptible than others—the very young and very old are more exempt than those of intermediate ages. Ulcers and other chronic *diseases*, also, seem occasionally to confer an insusceptibility on the constitution. The *latent period*, or that which elapses between the reception and manifestation of the contagion differs exceedingly, according to the degree of concentration in the poison and the predisposition of the subject. There is no doubt but that many doses of the poison are received which produce the fever or not according as the various predisposing causes are applied. It is, however, seldom less than fourteen, or more than sixty days between the receipt of the infection and the unfolding of the fever.

Marsh Miasma.—The febrifac effluvia of marshes, as well as human contagion, seem to have escaped the notice

of Hippocrates. This is the more to be wondered at, as many of the fevers which he describes are clearly the bilious remittent fevers of the present day, [see, for instance, *Popularium 1. Ægrotus octarus,*] and produced, of course by the same causes. Lancisius was the first who drew the attention of medical men to the subject, since which, marsh effluvium has been traced as the cause of some of the most destructive endemics that occur both within and without the tropics. The fevers of Cadiz, Carthagena, Gibraltar, and Zealand, may compete, in respect to virulence and fatality, with those of Batavia, Bengal, St. Domingo, and Philadelphia. The term *marsh*, is not so proper as *vegeto-animal* effluvium or miasma ; since experience and observation have proved, and these febrile exhalations arise from the summits of mountains as well as from the surfaces of swamps. The mountains of Ceylon, covered with woods and jungle, and the vast ghauts themselves, give origin to miasmata that occasion precisely the same fever as we witness on the marshy plains of Bengal.—But the subject of Miasmata will again come under consideration, in the Section on Endemic of Bengal.

Ratio Symptomatum.—We now proceed to trace the action of these febrile causes on the human frame—or in other words, the *ratio symptomatum* of fever itself ; for in nature and in truth, there is no such thing as a *proximate cause* of this disease, the whole train of

symptoms being a series of causes and effects, extremely difficult to delineate or comprehend. If any thing could deserve the name of *proximate cause*, it would be some peculiar state or phenomenon *invariably present* at the beginning of fever, and without which, the disease could not be said to exist. But all writers agree that there is no *one* symptom, state, or phenomenon which is constantly observable in fever. Neither quickness of pulse—increased heat—thirst, nor headache can be laid down as pathognomonic ; for although *some* of these are *always* present, no *one* of them is invariably so.

If an appeal, however, be made to accurate clinical observation, it will probably be found that from the first till the last moment of fever, *two phenomena* are constantly present—a derangement in the balance of the *circulation*, and of the *excitability*. If the calibre of the radial artery, or the strength and velocity of its pulsations shew nothing preternatural, (which by the bye will be a rare occurrence) yet, the experienced physician can instantly detect the unequal distribution of the vital fluid, as well by the torpid state of the *extreme vessels* on the surface, and throughout the glandular system, as by the turgidity of the *primary trunks*. The imperfect perspiration and secretions will point out the one ; the peculiar febrile anxiety—hurried respiration on attempting to sit up or move—fullness of the *præcordia*, and heaviness about the head, will clearly demonstrate the other. In no one instance, during a long acquain-

tance with fever, have I failed to notice these indications of a deranged balance of the *circulation*.

The proofs of broken balance in the *excitability* are equally manifest. It is now well known how much the functions of the glandular system are dependant on the nervous. In fever, the secretions are never perfectly natural. They are in general scanty—sometimes preternaturally copious; but always depraved. While this torpor or irregularity is going on in the glandular system, the nerves of sense shew plain marks of inequilibrium of excitability. The same degrees of light and sound that in health would be pleasing, will, in fever, be either distracting, or incapable of making any impression at all. The stomach will be in a state of morbid irritability, and the intestinal canal completely torpid. Speaking generally, however, the glandular or secreting system is irregularly torpid—the nervous or sentient system, irregularly irritable and debilitated.

Now if we find that the general operation of the various *predisposing* causes of fever, is to disturb more or less, according to the force and condition of the subject, the balance of the circulation and excitability, we advance one step nearer to a knowledge of this *proximate cause* in fever, because we find in it the same *ratio symptomatum* as in all the phlegmasiæ, modified only by the *exciting cause*. For example: one man is exposed to a rapid atmospherical transition, or a current of cold air when the body is heated; another man is exposed to the effluvium issuing from the body of a typhous patient;

third commits a great and unaccustomed debauch in spirituous or fermented liquors :—a fourth is overwhelmed with a series of losses and misfortunes ; a fifth is exposed to the exhalations arising from a fen; while a sixth performs a rapid and toilsome march under an ardent sun. These six men (and the list might be far extended) will have six different kinds of fever—all agreeing, however, in the two points under discussion [a derangement of balance in the circulation and in the excitability] but each offering *peculiar* traits and phenomena, in consequence of the *peculiarity* of cause.

Thus the *first* patient will, in all probability, have a fever remarkable for great vascular action, or derangement of the circulation, with a determination to some internal organ, most likely the lungs, in which determination or inflammation consists the chief danger.

The *second* man will have a fever at a much longer interval from the application of the cause, and which, contrary to the former case, will shew greater marks of derangement in the balance of the excitability, than of the circulation. In this instance, the functions of all the organs will be more or less affected; the fever sometimes running its whole course without producing morbid alteration of structure ; at other times, giving origin to congestion or inflammation in the brain, liver, stomach, &c. destroying the patient at various and uncertain stadia of the disease. To these peculiarities may be added the power of propagating itself by reproduction in other subjects.

The *third* man will have high vascular action, with considerable determination to the head, stomach, alimentary canal, &c. or probably that peculiar affection denominated "delirium tremens."

The *fourth* will have what is called a slow nervous fever so admirably described by Pringle.

The *fifth* will have a fever differing from all the preceding, inasmuch as it will shew great remissions, or even intermissions, on alternate days, with determinations, if long continued, to the liver and spleen.

The *sixth* man's fever will evince great violence at the beginning, with little or no remission; and end in a sudden determination to an internal organ—generally the liver; or change into a long and dangerous typhoid type.

Now the only symptoms or circumstances that are *invariably* present in *all* these cases, are the *inequilibria* abovementioned; the other varieties appearing to depend on the difference of cause, and idiosyncrasy of constitution. Need we then seek farther for a *proximate cause* of fever?

All the causes then of fever, from the most remote and predisposing, to the most immediate and exciting, however varied may be their *mode of action*, tend constantly to one point, and directly or indirectly to induce derangement in the balance of the circulation and excitability. Some of these *appear* to produce their *first* effects on the vascular, others on the nervous system. Thus atmospheric vicissitudes evidently give rise to

violent oscillations of the circulation; yet these transitions, and still more the oscillations must secondarily affect the nervous system. On the other hand, human and marsh effluvia seem to make their *first* impression on the nervous system, the circulation apparently becoming deranged consecutively. Of the two febrifac causes, however, human contagion shews its effects most on the nervous—marsh miasma, on the circulating system. Debauches and excesses operate on both systems, hurrying the circulation, exhausting the excitability, and producing fever, with or without local inflammation. The depressing passions, like human and marsh poison, seem also to affect *primarily* the nervous system, which, through every stage of the fever bears the onus of disease. Excessive muscular action and an ardent sun so much derange the circulation and the functions of certain internal organs, as to induce great fever with determination to the biliary organs, in particular.

The manner *how*, and the reason *why* these various causes, predisponent and exciting, act on the human frame producing the phenomena of fever, are equally inscrutable as the manner *how*, and reason *why* tartrite of antimony should have a tendency to act on the *upper*, and aloes on the *lower* portion of the alimentary canal. Let any person demonstrate the *modus operandi* of these two simple substances, and then I shall engage to demonstrate the *modus operandi* of human and marsh effluvia. The nature or essence of many of these causes

themselves, is also totally beyond our comprehension. Some of them are even *ideal*, as the various depressing passions, &c. Yet we must not cease to investigate the effects though we are ignorant of the nature and mode of action of the causes.

We shall now select one cause, and trace its operations on the human frame, as a sufficient specimen and explanation of the ratio symptomatum in all. The varieties and peculiarities from this specimen being, as I have stated before, ascribable to variety of cause and peculiarity of constitution.

A man after exposure to the miasma of marshes, begins to exhibit symptoms of diminished energy in the nervous system, evinced by the various feelings and phenomena which usher in the cold stage of fever.

The power of the heart and arteries appears evidently to be weakened, the consequence of which is an inability to propel the blood to the surface and throughout the secretory organs; and from the diminished excitability of the system, we observe a quiescence of the capillaries, and a shrinking and coldness of all external parts, without the intervention or necessity of spasm. In this state it follows, of course, and is allowed by all, that the great volume of blood is confined to the heart, and large internal trunks of vessels. But this appears an inadequate explanation of the swelling, tension, oppression, and even pain about the hypochondria, as well as of many other of the symptoms attendant on the cold stage of fever in particular. If during the latter, I place my

hand on the radial artery and endeavour to estimate its calibre, and the quantum of blood transmitted through it in a given time, compared with what takes place in the hot stage, or even in health, I shall conclude that the artery is not then above one-third the size, nor the quantity of blood passing through it, more in proportion. Such being the case, it is difficult to conceive how the whole mass of blood can be in *actual* circulation at this time. Besides, therefore, the confinement of a large share of it to the heart and large vessels, where its motions must be slow, I venture to affirm that another considerable portion of it is *arrested*, as it were, and accumulated in certain situations, where it remains *pro tempore*, out of the course of *actual* circulation. This congestion or complete quiescence, takes place in the portal circle, where the blood is, at all times, languid in its current, there being only a slight *vis a tergo*, and but little muscular propulsion. The consequence of this must be, that not only the liver and the various branches of the vena portarum, will become turgid, but also the spleen, (which returns its blood to the heart through this channel) the stomach, pancreas, and intestines, will participate in this turgescence.

If it be asked why the blood should cease to circulate in these parts during the cold stage of fever, sooner than in others ; I answer that the portal is the only circle or set of vessels in the sanguiferous system, *originating and terminating* in capillary tubes, or inosculations with

other vessels. They begin by the minutest threads from the stomach, spleen, pancreas, and intestines; these enlarge as they approach the liver; there they diverge, and finally dwindle again into the same diminution with which they commenced. All other veins dilate as they approximate to the heart, thereby affording more and more facility to the return of the blood, which is in most places assisted by the action of circumjacent muscles. The temporary quiescence or torpor, then, of the extreme branches of the vena portæ in the liver, from sympathy with the extreme vessels on the surface (before elucidated, and I hope satisfactorily proved) must completely check and arrest the reflux of blood from the whole of the viscera abovementioned. This state of things at once explains the tension, elevation, pain, weight, and anxiety about the præcordia. It shews why the biliary and pancreatic secretions are in common with, and still more particularly than others entirely checked for the time, while the gradual accumulation and temporary abstraction, as it were, of so great a proportion of the vital fluid from *actual* circulation, will readily account for most, if not all the phenomena of the *cold* stage, many of which were inexplicable on other principles. It appears to me, indeed, that this *temporary* arrest of so much blood in the liver and portal circle (including the spleen) is one of the most admirable of nature's expedients to obviate more dangerous effects. When the balance of the circulation is broken, and the blood is determined from the surface

upon the internal parts, were it all to accumulate in the large vessels about the heart, and in the lungs, immediate death would be the consequence ; but the local abstraction of so large a proportion of it, from *actual circulation*, by its quiescence in the circle abovementioned (where plethora is not so immediately detrimental) preserves the heart and lungs from being overpowered and suffocated, till reaction restores the equilibrium between the surface and the interior. From this view of the affair, the utility of the spleen, as an organ of preservation, is no longer doubtful.* But this accumulation of blood in the portal circle and viscera, must, of necessity, produce a corresponding plethora in the branches of the cæliac and mesenteric arteries leading to them ; and since such large and important exits for the blood from the descending aorta, are, as it were blocked up, a greater share of the circulating mass will be thrown in consequence through the carotids and vertebrals on the brain, occasioning or increasing the headache and congestion in that organ. This, and the congestion in the lungs, however, will be principally caused by the difficulty, indeed the inability of the heart to propel the blood from the ventricles as fast as it returns to the auricles from the brain and lungs ; hence the *venous* turgescence in both these organs, occasioning the headache, stupor, laborious respiration, and febrile anxiety attendant on the collapse or cold stage.

* Vide Dr. Armstrong's query; *Essay on Typhus*, p. 78

The effects of sympathy are likewise to be taken into consideration. I have mentioned that which exists between the extreme vessels on the surface, and those of the vena portæ. The lungs too will sympathise with the skin, while the stomach and liver will sympathise with the brain, and *vice versa*.

This state of things, however, lasts not long. Reaction at length takes place. Whether it be from "the stimulus of the blood itself"—from that of the "retained secretion"—from "accumulated excitability"—from the "vis medicatrix naturæ"—or from all combined, we need not stop to enquire, (because *final* causes can never be discovered, and because we are rather tracing the *quo* than the *quomodo* in fever) but so it is, that the brain, the heart, and the arteries re-acquire vigour—the two last driving the blood to the surface, with great increase of heat, and a more rapid circulation of the vital fluid, all of which, nevertheless, does not appear to come into motion, till the sweating stage. For this preternatural heat or febrile stricture seems to have the same effect, for a time, as the previous coldness or collapse, in preventing perspiration externally, and secretion internally; since we find the load and uneasiness at the præcordia and epigastrium continue till the extreme vessels on the surface relax, and a sweat breaks out, when a *simultaneous* relaxation in the extreme vessels of the liver, lungs, &c. allows the blood to pass on freely to the heart, and the various secretions to flow, relieving the internal congestions.

This last effect, so much accelerated by the cold affusion, in the hot stage of fever, seems to have escaped the notice of Currie and Clutterbuck.

As the headache of the cold stage, from *venous* plethora, is continued in the hot, from *arterial* distention (with a corresponding difference in sensation, as noticed by Fordyce) so the nausea and sickness at stomach, arising apparently in the cold fit from sympathy with the brain and liver, perhaps the skin, is continued in the hot, from the same causes (these organs being still affected, though in a somewhat different manner) and the vomiting is often brought on and kept up, by the sudden augmentation of gastric, biliary, and other secretions of a depraved quality, which are poured out towards the commencement of the sweating stage, particularly in hot climates, and in the hot seasons of temperate climates. In general, however, the irritability of the stomach subsides *pari passu*, as perspiration and secretion commence, with relief to the brain, lungs, liver, &c.

If, as some suppose, the cold be the cause of the succeeding hot stage, so in the latter, the violence of the re-action, or rather over-action of the sanguiferous system, with the morbidly increased excitement of the nervous system, must predispose to a repetition of the fits, from the subsequent atony produced thereby. If there be sensorial energy enough to enable the heart and arteries to clear the viscera and brain of the

load of blood with which they were oppressed, and to set the secreting organs in action, then an *intermission* takes place; but if these circumstances be incomplete, a *remission* only. In what is called continued fever, it appears from the affection of the head, the load on the præcordia, the confined pulse, the dry, hot, and constricted skin, with a corresponding diminished biliary secretion, and costive bowels, that the constitution is called upon for almost constant, or at least frequently reiterated exertions to relieve the internal congestions, and restore the secretions and excretions, marked by more or less of diurnal remission and evening exacerbation, till it either becomes habituated to the original cause, and restores the balance of the circulation and excitability, or sinks, unequal to the task, most commonly with the destruction (from inflammation or sanguineous determination) of an organ essential to life. Dissection has so repeatedly detected the existence of these inflammations, congestions, and effusions, in all fevers of violence, that it is not necessary here to quote any passages from practical authors on the subject. But it may be remarked, *en passant*, that no *one organ*, not even the brain, is so invariably the seat of lesion as to enable us to build any theory on the subject, and hence Dr. Clutterbuck has over-shot the mark by confining the cause of fever within the cranial parietes.

We now come to try the theory by a direct application of its principles to *practice*, the grand and only

legitimate criterion of its truth. If we can shew that it is consonant with, and elucidates the operation of those remedial measures which either ancient or modern experience has employed in fever, it is no trifling corroboration of its solid foundation. And, even if it points to the most successful plans of treatment which modern investigation has devised, it must be allowed to be a useful, though perhaps only a visionary theory.

It will not be necessary, however, to examine the whole farrago of remedies which ignorance, superstition, or prejudice had, at various periods, introduced for the treatment of fever ; it will be sufficient to notice those which have stood the test of time.

1st.—VENÆSECTION.

Blood-letting is as ancient as the wars of Troy, and the practice of Podalirius. If Hippocrates neglected it, Areteus, Celsus, and Galen made ample use of this important measure. It is true, that even in our own times, the dogmas of the schools had nearly proscribed for a while, what nature and observation had pointed out from the earliest dawn of medicine to the present time, in every climate from the banks of the Scamander to the vales of Otaheite.

The bounding pulse, the fever-flushed cheek, the throbbing temples, and aching head, must indeed have vindicated the propriety of bloodletting in every æra, and in every mind not warped by the bias of some fashionable doctrine.

In these scrutinising days of investigation and experiment, the lancet has dispelled the mists of prejudice, the phantoms of debility and putrescence, with the delusions of the Brunonian school; and bleeding is justly regarded as the paramount remedy, not only in symptomatic, but in all the more violent and fatal idiopathic fevers.

The consonance of this measure with the principles I have laid down, is so evident as scarcely to need comment. When the balance of the circulation is broken, and determinations take place to one or more organs, the most effectual means of restoring the balance, and of relieving these organs or parts from their overplus of blood, will be found either in local or general abstraction of the vital fluid. It is not from their being *less* than usual of blood, in some parts, but from there being *too much* in others, that the danger consists, and that we are called upon to reduce the whole mass below par. Nature herself, invariably points out this indication, and in perhaps a majority of instances, fulfills it in her own way. Thus we find that every paroxysm of fever is terminated by some evacuation from the system, whether by perspiration, urine, increased secretions, or some local haemorrhage. In what is called *continued fever*, the nocturnal exacerbations are terminated in the morning by some slight modifications of the foregoing evacuations; and in all fevers and all stages of fever, nature effects *depletion* by preventing *repletion*; and hence that invariable attendant on

fever *anorexia* is one of the wisest and most salutary measures which nature can put in force to finally overcome the disease; though she is too frequently baffled in her attempts by the officious interference of the cook, the nurse, or perhaps the medical prescriber.

I shall now make a few remarks on the most judicious manner of employing this remedy in fever; for on this, in a great measure, depends its success; and to the contrary, I believe may be attributed not only its failure, but its disgrace.

In the first place, the time for bloodletting in fever should be an object of great attention. It should not only be *early* in respect to the accession of the fever, but the *aeme* of the paroxysm, or the height of the exacerbation should be selected as the proper periods, for making the abstraction. At these times the evacuation will produce an alleviation of symptoms, and often a solution of the paroxysm or exacerbation; whereas if taken during the remission of the fever, when the system is, as it were, in a state of collapse, deliquium animi is often the consequence, followed by a train of nervous symptoms and debility that are charged on the *measure*, when they ought to be placed to the account of the ill-judged period of its application.

The manner in which blood is drawn ought not to be neglected. When any strong determination to the head, or other organ exists, the vascular system so accommodates itself to the loss of blood from a *thready* stream that little or no relief is obtained for the suffering viscus,

while the general strength is unnecessarily reduced by the quantum lost.

Although we are to be much less guided by the appearance of the blood drawn, than by the order and violence of the symptoms ; yet as a certain coat or crust of fibrine very generally, though not invariably, covers the coagulum when there is any local inflammation going on, we should attend to those circumstances in the abstraction that are favourable to the developement of this criterion. Thus the stream of blood should be free and of a good size ; and it should be received into the centre, not impinged against the side of, a narrow and rather deep basin, with a polished internal surface. If the reverse of these directions be observed, as is too often the case, the blood will not exhibit any inflammatory buff, though inflammation be actually present at the time.*

As in fevers, as well as some inflammations, it is not so much the general plethora of the vascular system, as the broken balance of the circulation that is to be corrected, so local abstractions of blood from the vicinity of those parts where the congestion or determination exists, are often of more importance than general blood-letting.

It is to be regretted that, whether from the prejudices of the patient or the inattention of the practitioner, the seat of the determinations in the fever is rarely ascer-

*Vide the inestimable work of Dr. Armstrong on Typhus. Also Dr. Dickson's writings on Tropical Fever.

tained and relieved by topical bleedings. The violent headache, indeed, and arterial pulsation at the temples, frequently draw the practitioner's attention to that part, and leeches are accordingly applied; but the epigastric region, where there is always more or less fulness, and to which the vital fluid seems in most fevers to gravitate, is too much neglected. Leeches or scarifications should long precede the necessity for blisters in these parts.

2nd.—PURGATIVES.

The ancient physicians had a very limited range, and a very rough list of purgative medicines. They made, however, a considerable use of them. Of late they were almost neglected by Cullen, and proscribed by Brown, in the fevers of this country, unaccompanied with topical inflammation. Dr. Hamilton and the greater number of modern practitioners employ purgatives freely, without fear of that far famed, and much dreaded debility. The principle on which these act, in fever, are by no means generally understood; and the practice itself is inefficient from this cause. Even Dr. Hamilton seems to attribute most of the good effects of purgatives in fever to the removal of irritating fecal remains. But if this were the case, the glysters of Cullen would have answered the same end, which, however, they did not. The removal of fecal accumulations, from the small intestines particularly, gives a more free descent to the blood through the abdominal aorta and

its branches, and thus mechanically assists in the restoration of balance; the increased secretion from the mucous membrane of the alimentary canal, must also powerfully deplete the cæliac vascular system; but a very salutary *modus operandi* of purgatives in fever, has, I believe, escaped the notice of physicians, although I conceive it to be an important one; I mean the change from torpor of the intestines to a brisk peristaltic motion, whereby the blood which has been shewn to accumulate, and as it were stagnate, in the portal circle, is propelled forward, and the biliary secretion increased. Another salutary effect is produced by the sympathetic influence which the internal surface of the alimentary canal exerts on the cutaneous surface of the body; for although drastic purging will check profuse perspiration, yet where torpor pervades both the internal and external surfaces of the body, a restoration of the functions of the former contributes to the same event in the latter; a fact, of which any one may convince himself at the bed-side of sickness by an attention to the circumstances under consideration.

When therefore the peristaltic motion, the gastric, and intestinal secretions are roused by purgatives, the head which, from the peculiarity of its circulation, must suffer sanguineous congestion, is almost immediately relieved by the *change of balance*, thereby induced. From these considerations it will not appear a matter of indifference, what purgative medicine we use. Experience has taught us that some (for instance castor

oil) do little more than clear the intestinal canal of what already exists there; that others (for instance the neutral salts, jalap, &c.) produce copious *watery secretions* into the alimentary tube, during their operation;— and that others still (for instance the submuriate of quicksilver), besides acting as a common purgative, increase particular secretions, as of the bile, and carry them off, whether in a healthy or morbid state.

From the importance of the hepatic function in the animal economy, and bad effects which result from any derangement or obstruction of it in febrile commotion, it is evident, and experience proves it, that into the combination of purgative medicines in fever, those of a chalagogue power should almost always enter. Hence it has been found both in this and other countries, that powdered jalap and submuriate of quicksilver formed a composition most admirably adapted to the purposes abovementioned, as may be seen by the writings of Rush, Jackson, Hamilton, Armstrong, Dickson, &c.

Hence also, we see how purging, by rousing the torpid circulation and excitability of the abdominal viscera, determining the blood through the various branches of the aorta which were before choaked up, and thereby removing the congestion in the head, restores strength, by relieving the sensorium, instead of adding to the pre-existent debility, as was dreaded by the Brunonians and Cullenians, and which dread still fetters the hands of numerous practitioners even in this country. The operation of purgatives then, is perfectly consonant with,

and elucidates the fundamental principle, to be kept in view in fever—*a restoration of equilibrium in the balance of the circulation and excitability.*”*

3d.—COLD AND tepid AFFUSION.

The operation of these *apparently* different measures, in mitigating or even arresting fever, is in perfect consonance with the principle laid down.

Leaving out the effect of *sensation* on the nervous system, during the affusion of cold water on the febrile surface of a patient, it is evident that the violence of reaction (at which time alone it ought to be applied) is mitigated by the cold, while the febrile irritation of a strictured surface is taken off.

That these objects tend to a restoration of balance in the circulation and excitability, need not be insisted on; the other effect of cold affusion, namely, a subsequent perspiration, will also be found to have a similar tendency.

The effect of *tepid* affusion during reaction, or the hot stage of fever, is precisely analogous to that of the cold, only less forcible in degree; for it must be remembered that the tepid bath is, or ought to be of a much *lower* temperature than the surface of the body, when applied in the *hot* stages of fever, and consequently acts in reality as a cold bath, only in a much more gentle manner.

When it is applied in the cold stage of fever, its

* Vide Dr. Dickson’s admirable papers in various numbers of the Edinburgh Medical and Surgical Journal.

operation in drawing the blood to the periphery, and thus restoring the balance of the *circulation*, is direct and obvious; while in restoring sensibility to the torpid skin, the balance of excitability is, of course, equipoised. The action of cool air in fevers is easily explicable on the same principles.

4th.—MERCURY.

Various have been the disputes respecting the operation of mercury on the human system. A stimulant property has been very generally attributed to this mineral, apparently from its quickening the vascular action, and “exciting an artificial fever.”* “Hence,” says the Enquirer [*loco citato*] “its efficacy in remittent and continued fevers is very equivocal. At the commencement of those diseases I believe that it does mischief, if exhibited in any form to exert its power on the salivary glands *alone*.” It would be difficult to select a passage in any medical work which contains so much error and so much want of knowledge, in so small a space, as the above paragraph. In the first place, those who condemn the use of mercury most, condemn it on this principle, that in some very concentrated forms of inflammatory fever, as the endemic of the West Indies, it cannot be brought to exert its influence on the system in time, and therefore there is danger in trusting to its operation. Mr. Sheppard, of Witney, one of the ablest of the anti-mercurial party, expresses himself thus:—

* Ed. Journal, vol. vi. p. 181.

"The co-existence of febrile and mercurial action is generally admitted to be incompatible; if, therefore, the action *could* be superinduced in violent fever, we should be possessed of an invaluable remedy."—*Ed. Journal, October, 1817.*

In the second place, who ever saw mercury affect the salivary glands *alone*? Narrow indeed, is that view of the mercurial action which stops short at its quickening the pulse, "and exciting an artificial fever." The fact is, that ptyalism is merely a symptom that the salivary glands are affected, in common with every other gland, and every secreting and excreting vessel in the system. Thus flood-gates are opened in all directions, and every part of the human fabric experiences a rapid diminution—in short, mercury is never more an *evacuant* than when it produces ptyalism. This general depletion is still farther increased by the ptyalism preventing any supply of nutriment which the patient or friends might wish to introduce.

I am ready to grant, indeed, that in certain high grades of the western endemic, or yellow fever, we cannot bring on this much desired effect of mercury; and why? Let Mr. Sheppard himself answer the question. "From the experience of many years within the tropics," says this judicious observer, "I am disposed to coincide with those who believe that the disease, in the highest degree of concentration, is *irremediable* by any known means in medicine; for I have remarked, in this extreme case, that whatever plan of cure may be adopt-

ed, the rate of mortality remained unaffected by variety of treatment." *Loco citato.* Now if mercury fails in these cases, so does depletion; but I most solemnly protest against the inference that, because pyrexia ceases when ptyalism appears, the *latter* is merely an effect or consequence of the former.

In the inflammatory forms of West India fevers where hepatic congestions are comparatively rare, I conceive that depletion *alone* is the best mode of treatment; but to draw a sweeping conclusion from this circumstance that mercury is totally useless, if not injurious, in all febrile states of the system, and in all climates, is most erroneous in principle, and injurious in practice. The ensuing pages of this essay will afford ample illustrations of the *febrifuge* powers of mercury; while its *modus agendi*, as an equaliser of the circulation and excitability, will be found to be in exact consonance with the principles here laid down.

5th.—EMETICS.

The gastric irritability which accompanies most fevers might have led to the suspicion that nature aimed at relief by unloading the stomach, and hence the early use of emetics.—They are now much less frequently employed; though it is certain that they produce other salutary effects beyond the mere evacuation of the stomach. They determine to the surface, in common with diaphoretics, and produce a relaxation there,

which generally ends in perspiration. Their utility therefore, in certain states and kinds of fever, is unquestionable, and consonant too with the principle which I have endeavoured to establish ; but their violence, in certain fevers and climates where unusual irritability of stomach too often prevails, has brought them much into disuse, even in opposite circumstances. The debility also which they induce gave the Brunonians a dislike to their employment.

6th.—DIAPHORETICS.

These have a close affinity to the last mentioned remedies, but are of milder operation. In all fevers of a marked periodical type, there is such an evident remission, or solution of the paroxysm in the sweating stage, that physicians must have very early endeavoured to imitate this salutary process of nature by artificial means. This, however, has often led to disastrous results ; for observing that heated rooms, multiplicity of clothing, warm liquors, &c. induced perspiration in health, the same means were resorted to in disease, and too often with the most pernicious consequences. They knew not till lately, that the strictured surface of a febrile patient will seldom relax into a perspirable state, till its temperature is *reduced* below the fever heat, and consequently when they failed in their object, they did much mischief, and when they succeeded in *forcing* out a perspiration, the temporary

relief obtained, by no means counterbalanced the previous increase of febrile excitement.

Now that the principles which govern the perspiratory process, are better understood, the long and endless farrago of sweating medicines is reduced to a few neutral salts, as the citrate of potash, or acetate of ammonia, accompanied occasionally with small doses of antimony. These, with *cool* diluent drinks, are the only safe or salutary diaphoretics in fever; and probably act on the surface from its sympathy with the stomach.

It is needless to state that the operation of this class of remedies is in perfect consonance with the principles I have endeavoured to maintain.

7th.—TONICS AND STIMULANTS, INCLUDING BARK, WINE, OPIUM, &c.

It may seem a little strange, that the most diametrically opposite plans have succeeded in fever, and been lauded to the skies by their supporters as infallible. Hence, many have supposed that were fevers left entirely in the hands of nature, as many would recover as under the most skilful treatment.

Whatever truth there may be in this, it is not equally correct that nearly the same proportion recover under all kinds of treatment. There is very little doubt but that under *judicious* modern measures, not only a greater proportion recover from the graver types of

fever, but a vast number of fevers are prevented from assuming the more dangerous forms.

Neither need it be wondered at, that both stimulants and sedatives should occasionally prove useful in fever. We have shewn that when the excitability and vascular action are too great in one part of the system, they are deficient in others; hence the diffusive stimuli have the effect of rousing the torpid parts into action, but too often at the expense of the over-excited organs ; and this has been the distinguishing feature of the Brunonian practice. Tonics and stimulants were also frequently necessary in the ultimate stages of fever, where early evacuations were not premised; because the system was exhausted by its own efforts, or by injudicious remedies, and nature required a stimulus at the close of the disease. But, now it is found, after fatal experience, that by lessening reaction at the beginning, we preserve the powers of the constitution for ulterior efforts, and thereby obviate the necessity of stimulation at almost any period of fever.

To shew how dangerous it was to draw conclusions respecting *debility* from the salutary operation of stimulants in fever, the following example may suffice. From deranged balance of excitability the heart and arteries become incapable of performing their office in a proper manner.—If their excitability be too great, they

* Vide Dr. Armstrong's work on Typhus, where the subject is handled with infinite skill.

drive the blood with an impetus to the brain that may cause delirium: if their excitability be defective, the heart is incapable of unloading the venous system, and distention of the veins and sinuses of the head produce the same effect. Now, wine, if given *judiciously*, and to a certain extent, in the *latter* case, will impart such vigour to the heart as will enable it to unload the venous system of the brain, and thereby remove the delirium, without giving too much impetus to the arterial system; but if the same medicine be exhibited in the former case, it will evidently increase the symptom it was intended to relieve!—In other words, some parts of the system being in a state of *torpor*, and others in a state of *irritability*, if stimulants be applied to the *former*, they *may* do good, but if to the *latter*, they *must* do harm. Hence the value and the necessity of discrimination in the practitioner; and the fatal effects of a *routine* practice.

In some of the more protracted fevers of this climate, assuming the typhoid and nervous type, the proper time for exhibiting the stimulating class of remedies requires the clearest judgment of the practitioner, and it is at these critical and decisive moments, that real ability unfolds its acuteness of discrimination, and snatches the patient from the jaws of death; while the blundering routinist unconsciously signs his quietus!

Little need be said of the minor or subordinate remedies, as blisters, sinapisms, &c. as their operation is evidently to restore the balance of the circulation and

excitability by soliciting artificial determinations to superficial parts, with the view of relieving internal congestions or inflammations.

ENDEMIC FEVER OF BENGAL,

Commonly called the Marsh Remittent Fever.

SEC. II.—The importance of this disease will not be questioned, when it is considered, that in the small portion of the Hoogly, running between Calcutta and Kedgeree, full three hundred European sailors (better than a fourth of the ships' crews) fall annual victims to its ravages!* The subject therefore is highly interesting, and must receive a considerable share of our attention.

There is no unmixed good in this world. The inundations of the Nile and the Ganges, while they scatter fertility over the valley of Egypt, and the plains of Bengal, sow with a liberal hand, at the same time, the seeds of dreadful diseases! Hence, Cairo and Calcutta have severely suffered from the overflowings of their respective rivers.

These consequences are not confined to tropical countries alone. Swamps and marshes, in all latitudes, give rise to intermittents and remittents, varying in degree and danger, according to the heat, rains, and other circumstances of the season. The deleterious influence of an atmosphere, impregnated with marsh effluvia, on the

* Vide Capt. Williamson's East India Vade Mecum.

human frame, is in some places astonishing. In the lower districts of Georgia, life is curtailed to forty or fifty years.

I have myself, in rambling through the villages of Beveland and Walcheren, been struck with the conspicuous marks of premature old age, which all, beyond maturity, exhibited; particularly among the peasantry. On enquiring the ages of decrepid wretches, withered, sallow, and apparently on the borders of fourscore, I was surprised to find that fifty-five or sixty years were all they had numbered in these noxious fens. Often have I been asked by inattentive observers, why so unhealthy a country should present so great a number of very old people? But, to return to the Ganges.

This immense river, originating in the mountains of Tibet, and winding in a south-eastern direction, collecting its tributary streams from all quarters as it proceeds, after a course of more than a thousand miles, bursts its boundaries, in the rainy season, and covers the plains of Bengal with an expansive sheet of turbid water. But the ground springing a little, as it approaches the coast, prevents the inundation from rushing at once into the ocean: it therefore disembogues itself slowly through a multiplicity of channels, that intersect the great Indian Delta, or Sunderbunds, in every possible direction.

This check keeps the plains of Bengal overflowed from the latter end of July till the middle of October; during which period, noted cities, populous villages, exalted mosques, and stupendous pagodas, are seen just

above the level of this temporary ocean, surrounded by innumerable boats, now the habitations of domesticated animals.

At this time, vessels even of an hundred tons are beheld traversing the country in various routes, wafted by a breeze that seldom shifts more than a point or two from South.—The depth of water during the inundation, varies from ten to thirty feet, according to the undulations of the ground. The original course of rivers is now known only by their currents, which may have a velocity of four miles an hour, on an average, while the great body of water, spread over the plains, moves at the rate of half a mile or a mile, in the same space of time.

A chemical analysis of the various impregnations and impurities which the Ganges and its contributory streams sweep down to Bengal, and which either subside in feculence on the soil, or are carried on to the sea, would form an interesting memoir;—It will be sufficient in this place to glance at a few of them.

The Western bank of the Ganges itself, between Hurdwar and Benares, consists in general of lime, concreted in irregular masses; and all the rivers which issue from the Western bank are more or less impregnated with the same substance; while on the opposite bank the waters partake of a strong solution of nitre, with which the plains of Oude, Fyzabda, and Gazeepoor, abound. The country lying between the Ganges and

the Goomty, on the Eastern bank, is replete with fossil alkali, named "seedgy," giving rise to severe bowel complaints among, the natives; while the swamps of Sasseram are annually in a state of partial corruption, sufficient to occasion the most malignant diseases in the month of November, when the sun's power promotes an astonishing evaporation, filling the air with miasmata, and spreading destruction among all the living tribes.

The Mahana, the Mutwalla, and various other mountain rivers, that rush into the Ganges between Patna and Boglepore, are frequently tinged with copper. The 12th Battalion of Native Infantry were nearly poisoned by drinking at one of these streams.

But it would be endless to trace all the sources of pollution in the vegetable and mineral kingdoms; one or two only in the animal kingdom will be selected as specimens in that extensive department.

The Hindoo religion enacts, that as soon as the spirit has taken its departure, the body shall be burnt on the banks of the Ganges, and that the ashes, together with every fragment of the funeral pile, be committed to the sacred stream. In a country where dissolution and putrefaction are nearly simultaneous, the utility of such a measure is self-evident; but either from indolence or penury, the body is now generally placed on a small hurdle, and when little more than scorched, is pushed off from the shore with a bamboo, there to float until it ar-

Pives at the ocean, unless it be previously picked up by a shark or alligator; or, which is frequently the case, dragged ashore by Pariar dogs, and devoured by them, in company with a numerous train of carrion birds of various descriptions. From one hundred to one hundred and fifty of these disgusting objects may be counted passing one point in the course of a day; and in some places, where eddies prevails, a whole vortex of putrid corses may be seen circling about for hours together! It was very common for us to be obliged to "clear the cable" occasionally, of a human body, speckled over by the partial separation of the cuticle and rete mucosum from putrefaction.

Each contributary stream brings down its full proportion of these ingredients to the general reservoir; since the inland inhabitants have always recourse to that which is most contiguous to their village; and strange as it may appear, where no stream is at hand, the nearest tank, or jcel, performs the vicarious office of the sacred Ganges, supplying drink for the living, and a final receptacle for the dead! We may add, that the banks of this river present, particularly about the rising and setting of the sun, a motley group of all classes, and sometimes both sexes, sacrificing to the Goddess Cloacina, in colloquial association; not indeed offering their gifts in temples, but committing them freely to the passing current.

So born and fed mid Tauran's mountain snows,
Pure as his source, awhile young Ganges flows;

Through flow'ry meads his loit'ring way pursues,
And quaffs with gentle lip the nectar'd dews ;
Then broad and rough, through wilds unknown to day,
Through woods and swamps, where tigers prowl for prey,
He roams along ; and rushing to the main,
Drinks deep pollution from each tainted plain.

I have remarked, that the ground springs a little near the sea, and by resisting the progress of the inundation lays the more inland plains under water. This is an important circumstance in the medical topography of the country; since the more complete the inundation, the more healthy are the inhabitants, till the fall of the waters in November and December exposes a number of miry and slimy marshes to the action of a still powerful sun, when those who are in their neighbourhood, are sure to come in for a share of remittents and intermittents.

It is worthy of remark here, that in those years, when the rains are late in setting in, many people are suddenly cut off by the intense heat of the sun in June and July. But this is nothing compared to the havoc produced by a sudden and premature cessation of the rains, or *Bursautty*, as they are called. In this last case an immense surface of slime and feculence is all at once exposed to the rays of a vertical sun, that has lost nothing of his power by a Southern declination. The consequence is, that the profuse exhalation of miasmata spreads pestilence and death in every direction; while famine, from the rice being left dry before it has attained maturity, completes the dreadful catastrophe!

But the sunderbunds, and the country, for some way round Calcutta, being in most places rather above the level of high water mark, become, during the rainy season, an immense woody and jungly marsh, neither perfectly overflowed, nor yet quite dry—in a word, presenting a surface as well supplied with animal and vegetable matters in a state of decomposition, and combining all the other circumstances necessary for giving miasmata their full influence on the human body, viz. intense heat, moisture, calms, &c. as perhaps any spot of equal extent on the face of the globe.

These sunderbunds form a belt between the Hoogly and the Megna of about 180 miles in length, by 50 in depth, completely over-run with forests, underwood, and jungle; and inhabited by animals of various species, who are left to the uninterrupted possession of this frightful territory!

The rainy season commences about the middle of June, and lasts till the middle or latter end of October, though the waters are not drained off low situations till December. During this period, the deluges of rain that appear to come down occasionally “en masse” from the heavens, would almost stagger the belief of any one who had not witnessed them.

The inhabitants and domestic animals of inundated districts are all this time cooped up in a state of ennui, or torpor, which to an active European would be dreadful, had he not a number of mental, as well as corporeal resources for beguiling the tedious hours. But at Cal-

cutta and Diamond harbour it is far otherwise. There the Europeans are not confined, and business must be attended to, as much as during the dry, or the cool and healthy season. It will not, therefore, appear extraordinary, that under all circumstances related, the marsh remittent fever should make such ravages among all classes, but more particularly among those who are exposed to the sultry heat of the day—the rains, the dews, and intemperance.

Having sufficiently explored the sources from whence vegeto-animal miasmata take their rise, I shall defer the investigation of their nature, or operation on the human frame, till the fever which they occasion is considered.

There can scarcely be conceived a situation of greater anxiety and distress, than that in which a young medical man of any sensibility is placed, on arriving at an unhealthy spot in a foreign climate, unfortified by experience, unaided by advice, and, as is too frequently the case, but scantily supplied with books, containing local accounts of the country and its prevailing diseases.

In such cases, he is forced to explore his way in the dark, agitated and alarmed by the mortality around him; a great share of which he attributes, perhaps with more remorse than justice, to his own misconduct, or ignorance of the proper treatment !

We arrived in the Hoogly, in the month of September after a short run of little more than three months

from England ; which place we left without the least knowledge of our ultimate destination. The fever in question was then making prodigious havoc among the ships' crew's at Diamond harbour, and other parts of the river; nor were we long exempted from its visitation. All circumstances considered, I thought myself fortunate in having in my possession, the works of two celebrated authors, (Clark and Lind) containing a full account of this fever, drawn from personal observation on the spot. I accordingly—

“ Read them by day and studied them by night;”

In short, I was quite anxious to grapple with this Hydra disease, and shew the power of medicine over this scourge of Europeans.

Many days did not elapse before I had an opportunity of trying my strength against so formidable an opponent, and a very few trials convinced me I had calculated without my host, and that I must use other weapons than those furnished me by Drs. Lind and Clarke, if I meant to be victorious in the contest.

Dr. Clarke's *description* of this fever, however, is so singularly chaste and correct, that were I to draw the picture myself, I must either use his own words, or give a false portrait. I shall therefore only add a few observations of my own in a note, and recommend Dr. C's description to be carefully compared with that of the yellow fever in another part of the work.

" This fever attacked in various ways, but commonly began with rigors, *pain* and sickness at stomach; vomiting, headache, *oppression on the præcordia*, and great dejection of spirits. Sometimes, without any previous indisposition, the patients fell down in a delirium, during the continuance of which the countenance was very pale and gloomy ; as they began to recover from the fit, they expressed the *pain* they suffered by applying their hands to the *stomach and head*; and after vomiting a considerable quantity of bile, they soon returned to their senses. Sometimes the attack was so sudden and attended with such *excruciating pain at the stomach*, that I have been obliged to give an opiate immediately.*

* It is a little singular, that Dr. Lind, of Windsor, in his inaugural dissertation on this fever, never once mentions "oppression on the præcordia,"—"pain at the stomach,"—or "fullness and tenderness in the epigastric region." I can safely assert, that I seldom saw an instance in which all of these were wanting—seldom, indeed, an instance in which they were not all present. It is true, that this endemic is not always arrayed in the same colours ; but the above-mentioned symptoms are so constantly attendant on fevers, in all hot climates particularly, that the omission of them is rather remarkable.

Dr. Lind mentions a symptom not noticed by Dr. Clark, and which I have often observed. After remarking that bile was frequently ejected both upwards and downwards, he says—"Vomitus et dejectiones tamen plerumque albi coloris erant calcis aquæ commistæ, vel lactis illius quod lactentes evomunt." Neither of them has mentioned delirium,

" In whatever form the disease appeared at first, the pulse was small, feeble, and quick,—the pain at the stomach increased, and the vomiting continued. As the paroxysm advanced, the countenance became flushed—the pulse quick and full—the eyes red—tongue furred—thirst intense—head-ache violent, deliriums succeeded, and the patient became unmanageable; but a profuse sweat breaking out in twelve or fourteen hours, generally mitigated all the symptoms.

" In the remissions, the pulse, which before was frequently 130, fell to 90. The patient returned to his senses, but complained of great debility; sickness at stomach, and bitter taste in the mouth. This interval, which was very short, was succeeded by another paroxysm, in which all the former symptoms were aggravated, particularly the thirst, delirium, pain at the stomach, and vomiting of bile. If the disease was neglected in the beginning, the remissions totally dis-

as often the *first* indication of the fever. Many a time have I been called to see men, whom their messmates represented as " mad ;" not in the least suspecting that it was the fever which they were seized with. This symptom generally happened among young men who were employed in boats, and who were not only more exposed than others to marsh effluvia, but to the fervency of the sun by day, and often to the dews and night air. A few instances likewise occurred where the patient attempted to jump over-board. This symptom is not very rare in bilious and other fevers, where there is great congestion or determination to the brain.

appeared, and the skin now became moist and clammy. the pulse was small and irregular, the tongue black and crusted, and the pain at the stomach and vomiting of bile become more violent." It is needless to say, that from this period till death closed the scene; the features of this fever were such as characterise the last moments of all violent and fatal fevers.

The unfavourable terminations were generally between the third and seventh day, though in some cases I have seen it go on to the fifteenth or twentieth day; but visceral obstructions were almost always the consequence; and hepatitis or dysentery completed what the fever failed to accomplish. I may add that several cases occurred under my own inspection where there was a yellowish suffusion on the skin, as in the endemic of the west, with vomiting of matter bearing a considerable similarity to the grounds of coffee. This suffusion of bile, or yellow colour on the skin, is by no means an uncommon symptom in the fevers of the East, as will be shewn hereafter. The natives themselves frequently exhibit this appearance, when extensive epidemics prevail in the lower situations of Bengal, as appears by the following quotation, from Captain Williamson. "Certainly, (says this intelligent officer) it is common to see whole villages in a state of jaundice; and in some years the ravages of the disease (marsh remittent) are truly formidable." A torpid, or, at least, irregular state of the bowels, almost invariably precedes this fever; unless in cases where the effects of the

paludal effluvia are suddenly brought out, by exposure to the intense heat of the sun by day, and the chilling dews and fogs of the nights, among boats' crews. In these, of course, there were few pre-monitory symptoms. In respect to the cure, Dr. Clark asserts, that "nothing is more indispensably necessary in the beginning than to cleanse the intestinal tubes by gentle *vomits* and purges." * * * * "As soon as the intestinal tubes have been thoroughly cleansed, the cure must *entirely* depend upon giving the Peruvian bark, in as large doses as the patient's stomach will bear, without paying *any regard to the remissions, or exacerbations of the fever.*" Such are the plain and easy instructions which Drs. Clarke and Lind have left for our guidance in this fearful endemic. They certainly are not, apparently, difficult to follow; and heaven knows I endeavoured, most religiously, to fulfil every iota of their injunctions; but with what success a single case will shew.

A young man, of a good constitution, in the prime of life and health, had been assisting with several others, to navigate an Indiaman through the Hoogly. The day after he returned, he was seized with the usual symptoms of this fever. I did not see him till the cold stage was past; but the re-action was violent—the head-ache intense—skin burning hot—great oppression about the praecordia, with quick, hard pulse—thirst, and nausea. An emetic was prescribed, and towards the close of its operation discharged a quantity of ill-

conditioned bile, both upwards and downwards; soon after which, a perspiration broke out, the febrile symptoms subsided, and a remission, almost amounting to an intermission, followed. I now, with an air of confidence, began to "thrown in" the bark; quite sanguine in my expectations of soon checking this formidable disease. But, alas ! my triumph was of very short duration; for in a few hours the fever returned with increased violence, and attended with such obstinate vomiting, that although I tried to push on the bark through the paroxysm, by the aid of opium, effervescent draughts, &c. it was all fruitless; for every dose was rejected the moment it was swallowed, and I was forced to abandon the only means by which I had hoped to curb the fury of the disease.

The other methods which I tried need not be enumerated: they were temporising shifts, calculated, in medical language, "to obviate occasional symptoms."

The plain truth was, that I knew not what to do; for the sudden and unexpected failure of that medicine on which I was taught to depend, completely embarrassed me, and before I could make up my mind to any feasible plan of treatment, my patient died, on the third day of his illness, perfectly yellow—vomiting to the last, a dark fluid resembling vitiated bile, and exhibiting an awful specimen of the effects which a Bengal fever is capable of producing, in so short a period, on a European in the vigour of manhood !

With feelings more easily conceived than described,

I had the body conveyed to a convenient place, in hopes that dissection might afford some clue to my future efforts. On laying open the abdomen, I was surprised to find the liver so gorged, as it were, with blood that it actually fell to pieces on handling it. Indeed, it appeared as if the greater number of the vessels had been broken down, and almost the whole of the interior structure converted into a mass of extravasation. The gall bladder contained a small quantity of bile, in colour and consistence resembling tar, and the ductus communis choledochus was so thickened in its coats, and contracted in its diameter, that a probe could scarcely be passed into it. Marks of incipient inflammation were visible in some parts of the small intestines, and the internal surface of the stomach exhibited similar appearances. The thorax was not examined, on account of the time taken up in getting at the brain. Marks of turgescence, in the venous system of vessels particularly, were there quite evident, and more than the usual quantity of lymph was found in the ventricles, but no appearance of actual inflammation.

This case requires little comment. It is pretty clear that it would have required some ingenuity to devise a more injudicious mode of treatment, than that which I pursued. But it taught me an important lesson—it opened my eyes to my own folly, and, pace tantorum virorum, to the oversight of my teachers. It is but too true, that we are nearly as reluctant in acknowledging our failures, as we are forward in blazoning our suc-

ses. In so uncertain a science as that of medicine, this has always been a considerable obstacle to its progress and improvement; since, while we read of the great good fortune of others, and the surprising cures they have performed, and then find our own so far deficient in that respect, even when we are carefully treading their steps, we despond, and become exceedingly sceptical in regard to the truth of those statements. These reflections are not meant to bear on the veracity or candour of Dr. Clark, both of which I highly respect—but as he has only published two unsuccessful cases—“in the most malignant fever he had ever seen in any part of the East Indies,”—viz. the Bengal fever, it may justly be questioned whether he would not have done more good, by detailing a greater proportion of the fatal terminations, than by confining himself to two solitary instances, without a single dissection. A careful perusal of the first of these that occur on the list (Henry Pope, case 6), will probably convince the reader that I was not the only person who had mistaken the nature of the disease, and that—

“Aliquando dormitat bonus Homerus.”

In fact, the determination to the liver and the brain, is perfectly evident, from the beginning to the end of this case: and although no dissection took place, we cannot for a moment, doubt the appearances which it would have exhibited.

The impression made on my mind, by the dissection on one hand, and the perusal of Dr. Clark's case (Henry Pope) on the other, determined me to try venesection, notwithstanding the dreadful accounts which Dr. C. himself gives of its fatal effects. I had now several down with the fever; and must confess it was with a trembling arm and palpitating heart, that I first opened a vein, expecting every instant to see my patient die under my hands.

He did not die, however; nay, he seemed evidently relieved, but the bad symptoms soon returned, and the bleeding was repeated, with brisk evacuations. He recovered.

I now carried the evacuating plan with a high hand, and with much better success than I expected. Fortunately for my patients, a great majority of them were fresh from Europe, and high in health and strength; these recovered wonderfully, after bleeding and evacuations, though not always.

But there was on board a class of men whom we had pressed out of ships on their return from India, who had experienced, not only the influence of the climate, but of depressing passions, arising from "hope deferred," and the galling disappointment they must have felt, while treading back their steps to a distant country, after they had been on the very point of mingling with their friends and relations at home!

These required a more discriminated mode of treatment. Evacuations at the very beginning were neces-

sary; but something more was requisite, to clear the congestions from the head and liver. The fluids here, to use a simile, were too stagnant to drain off, of their own accord, even when a sluice was opened—they required propulsion.

It would be humiliating to myself, and perhaps uninteresting to my readers, to enumerate the many glaring blunders which I committed, and the false conclusions which I drew, before I arrived at any thing like a steady and successful method of checking this Herculean epidemic. Let those whose eagle eye and towering intellect can penetrate, at a single glance, the secrets of nature, and curb with ease the reins of impetuous disease, place their hands on their breasts (if something within does not prevent them) and thank their God that "*they are not like other men.*"

But to return to our subject. The first symptom that claims our most serious attention in this disease, is that irritability of the stomach, accompanied by a distressing vomiting. Till this is allayed, nothing can be done towards the cure, by way of medicine. Now venesection has considerable effect in procuring alleviation, even of this symptom. But the trifling manner in which it is too often performed, when it is ventured on at all, does more harm than good. *Bleed boldly and decisively till the head and praecordia are relieved, or draw no blood whatever.*

While this is doing, a scruple of calomel, with half a grain or a grain of opium, should be immediately given;

this will act like a charm on the stomach. I shall prove, in the course of this essay, what, indeed, is well known to many of my brother officers who have served in India, that twenty grains of calomel will act as a *sedative*, and so far from griping and producing hypercatharsis, it will sooth uneasiness, and rather constipate than purge. On this account, in the course of a few hours, when the vomiting is assuaged, some purgative must be given, as cathartic extract, with calomel, castor oil, or even salts, which will seldom fail to bring away a most copious discharge of intolerably foetid, bilious, and seculent matter, to the unspeakable relief of the head and epigastrium. To facilitate and accelerate this most desirable object, purgative glysters should be thrown up. The more copious the catharsis, the less danger there will be of the return of vomiting.

If there be now a return of any of those dangerous symptoms, intense head-ache, delirium, or pain in the epigastric region, no apprehension need be entertained of the lancet once more.* Those bugbears, debility, and putrescence, still paralyze the arms of medical men in hot climates, notwithstanding the clearest evidence in favour of venesection, particularly where the subject is lately from Europe, and not broken down by the climate.

Immediately after the operation of the cathartic, the

* The jugular vein, where the head is oppressed, will be the best exit for the blood.

main-spring of the cure must be acted on. For this purpose, from five to ten grains of calomel, according to the urgency of the symptoms, combined or not with half a grain of opium, should be exhibited every four or six hours, till ptyalism is well raised; when, in nineteen cases out of twenty (I might say forty-nine out of fifty) there will be a remission of all the febrile symptoms, and safety secured. This is undoubtedly the *sine qua non*, in the medical treatment of this fever, as well as many other fevers in the East.

It is hardly necessary to remark, that emetics are exceedingly doubtful, if not prejudicial medicines in this endemic, since gastric irritability is one of the most distressing and difficult symptoms with which we have to contend. Yet many judicious practitioners, in the navy especially, still employ them, as will be seen hereafter; my own experience, however, and observations are decidedly against them.

But, on the other hand, cathartics are eminently useful. There is, in this fever, either an obstinate costiveness, or dysenteric purging; no such thing as natural feces, tinged with healthy bile, will ever be seen: when such can be obtained by purgatives, a great and evident advantage is gained. It may seem strange that I should recommend calomel and opium anterior to the administration of laxatives; but, independent of the necessity which there is of allaying the irritability of the stomach, whoever will compare the discharge procured by cathartics given *previously* to the calomel and opium, with that

which follows the *subsequent* exhibition of them will decide in favor of the latter plan.

Once every day then, the dose of calomel, usually given every four or six hours, should be conjoined with ten or fifteen grains of ex. colcynth. com. jalap, or an ounce of castor oil, omitting the opium for that time. These will be sure to bring down a copious alvine evacuation, composed of highly vitiated bile and fecal sordes, that had been lurking in the convolutions of the intestines and cells of the colon, during that torpid state of the bowels which generally precedes the attack of fever.

This will greatly relieve the oppression and tension of the epigastrium, as well as the head-ache; indeed so striking is the amelioration of symptoms, after these intestinal evacuations, that in two or three instances I was tempted to follow them up, and try if they might not supersede the necessity of impregnating the system with mercury. I trod here on tender ground; I was forced to measure back my steps, and have recourse in the end to that powerful and invaluable medicine, but in one case it was too late! Warned by this, whenever I combined a purgative, with the calomel afterwards, I directed a mercurial friction or two to be employed during their operation, to prevent a halt in the pursuit of my ulterior and principal object—ptyalism.

In the mean time, while things are in this train, there are several objects which, though of a secondary consideration, the prudent practitioner will do well to keep

view. In the first place, the patient should be removed to the most airy and cool part of the ship or house; he should be made perfectly clean; and as there is, in nine cases out of ten, a great determination to the brain, his feet may be immersed occasionally in warm water. His head should be elevated, shaved, and numerous folds of linen or cotton, moistened with vinegar and water artificially cooled, kept constantly applied to applied to it.

Sir James Mc. Grigor remarks in his Medical Sketches, that the cold bath did not succeed in the fevers of India. "On my arrival there (says he) I tried it in several cases, but it failed. This fever is commonly of the remittent type, there is much reaction; it seems in most cases *symptomatic of liver affection, and often terminates in hepatitis.*" There is some obscurity in the latter part of this passage; but at all events, Sir James Mc. Grigor cannot allude to the fever under consideration; for although the liver, as I shall hereafter endeavour to prove, is in this, and perhaps in all other fevers, *affected*; yet it would be carrying a theory to extremes to assert, that the Bengal Marsh Remittent, confessedly produced by paludal effluvia, in conjunction with heat and moisture, was, "in most cases *symptomatic of liver affection.*" It is probable that Sir James Mc. Grigor had not an opportunity of seeing *this* fever; as his observation, in regard to "*liver affection,*" applies more strictly to those fevers denominated "*Bilious,*" which are prevalent at Bombay, the coast of Cor-

omandel, and other elevated parts of India, in which Sir James Mc. Grigor served—Vide Sec. 7.

How far the cold affusion in these *last* fevers may be applicable, this is not the place to inquire; but in the Bengal Remittent, it has been practiced, time immemorial, among the natives themselves, many a century before a Jackson, a Wright, or a Currie, ever thought or wrote on the subject, as the following quotation from a gentleman *out of the profession*, and who, of course, has no other object than truth in view, will prove.—“We must, however,” says Capt. Williamson, author of Oriental Field Sports, &c. “do the natives the justice to allow, that the refrigerating principle, lately adopted by some of our leading physicians, owes its origin solely to the *ancient practice* of the Brahmans, or Hindoo priests, of whom the generality affect to be deeply skilled in pharmaeey. I believe that, if taken in time, few fevers would be found to degenerate into typhus, and that very seldom any determination towards the liver, in acute cases, would occur, were the refrigerating course to be adopted. Often have I known my servants, when attacked with fever, to *drink cold water* in abundance, and to apply *wetted cloths to their heads*, with great success. The former has generally lowered the pulse considerably, by throwing out a strong perspiration, while the latter has given immediate local relief.”—Vol. 2. p. 308.

I can confirm the truth of this, by experience, acquired long before I knew any thing of this native prac-

tice, and to which I was led by the unconquerable headache, heat, and throbbing of the temples, which nothing but venesection and the cold ablutions abovementioned, would completely allay.

Mr. Bruce describes a somewhat similar practice among the natives of Massuah, a very unhealthy island on the borders of Abyssinia.—

“Violent fevers, called the *Nedad*, make the principal figure in this fatal list, and generally terminate the third day in death. If the patient survives till the fifth day, he very often recovers, by drinking water only, and throwing a great quantity upon him, even in his bed, where he is permitted to lie without attempting to make him dry, or change his bed, till another deluge adds to the first.” *Shaw’s Abridgement*, p. 156. Cold water, cold cungee water, or either of these acidulated with tamarinds, chrystals of tartar, or nitrous acid, will be found the most grateful beverage. But it is necessary to remark, that, till the irritability of the stomach is allayed, however urgent may be the thirst, the patient should be restrained from drink, especially in any large quantities. The cold ablution over the surface of the body will help to mitigate the thirst, till the stomach is tranquilised.

Leeches succeeded by large and repeated blisters to the epigastric region, will be found a most valuable auxiliary to the above plan of treatment; and, where torpor in the lymphatic system of the abdomen is evinced by difficulty in affecting the mouth with mercury, the

denuded surface should be dressed with mercurial ointment. With these means in use, I have generally awaited, with a kind of patient anxiety, the first symptoms of ptyalism; and on the third morning, I could frequently perceive a certain odour on the breath, prelusive of salivation. When this last came on *free*, I pronounced my patient to be secure.

But if no symptoms of saturation appeared, I have *then*, or indeed, if things wore an alarming aspect, I have sooner than this, either increased the doses of calomel, exhibited them at shorter intervals, or conjoined with them mercurial frictions. For if relief could not be procured on the third, fourth, or fifth day, the chance of recovery became smaller and smaller in proportion.

This relief sometimes preceded, sometimes succeeded; but was generally synchronous with the visible or sensible effects of mercury on the constitution, as evinced by the gums or breath. A mild and uniform diaphoresis, a refreshing sleep, and the appearance of natural stools, were the usual indications of this happy change; after which, as the ptyalism advanced, the train of morbid symptoms proportionally subsided, till at length the inability to eat, *in consequence of the soreness of the mouth* became the principal complaint of the patient. Were I to go over the same ground again, I should be inclined to try a still more decisive system of depletion by blood-letting and purging, so as thereby to arrest the progress of the fever, even before the developement of the mercurial action. But time and circumstances will so vary the features of this and

other fevers, that different, and sometimes opposite modes of treatment must be adopted.

That there may be cases, whercin the use of wine, and even bark, is indispensable, I shall not attempt to deny. But the latter, in particular, I seldom had occasion to employ, except in cases of protracted convalescence; or to prevent relapses at the full and change of the moon, when such accidents are very liable to happen.

I have only to remark further, that when this fever was combined with dysentery, an occurrence by no means unusual, the same treatment, with the exception of cold external applications, conducted equally to a happy termination.

As the object of this essay is unity, and its design, to convey as much information on each subject, in a small space, as possible; it becomes a duty to notice in this place the opinions and practice of a very high medical authority in India—Dr. Balfour, whose abilities and experience entitle him to every respect. I shall endeavour to condense his doctrine and directions into as few pages as I can, referring to his *second Treatise on Sol-lunar Influence* (Edin. 1790) where these are more explicitly developed than in any of his other publications.

Dr. B. considers the mild and regular intermittent, as well as the more violent and continued Bengal fevers, together with dysentery, as so many grades of the “*putrid intestinal remitting fever*,” all of which he

pronounces to be *infectious*. He conceives that the contagion proceeds from putrefying or putrid bodies, and which, passing down with the saliva, corrupts the mucus of the stomach and intestines. That *this* putrid matter being absorbed, and carried into the circulation, gives rise to, and accounts for, the whole train of febrile symptoms. This is his theory, independant of "Sol-lunar Influence," which will be noticed hereafter.

With respect to the cure, he thinks that copious and continued purging would, in general, be sufficient to conduct mild cases to a successful issue; but as we are liable to much deception, he advises that in these, as well as in the most violent fevers of Bengal, after *two days* purging with calomel and other cathartics, to begin, on the *third* morning, to "throw in" the bark in substance, so as to administer two ounces in the course of forty-eight hours. At the expiration of this period, the calomel is to be again repeated at night, and a laxative the next morning; immediately after the operation of which, the bark is to be again reiterated for two days, and in the same manner as before. The purges and bark are thus to be alternated in exactly the above routine, till the disease is finally subdued. To give efficacy to this practice, a liberal use is to be made of opium, not only to keep the bark on the stomach, but to ease pain and procure rest.

With respect to those cases where there is *local affection*, Dr. B. only directs a superior degree of attention to be paid in guarding the body against cold, with oc-

casional blisters and diaphoretics. In some rare cases, where the local affection is violent, he admits of bleeding, both general and local; but all the other plans are to be pursued in the manner prescribed, without any regard to paroxysms, remissions, or exacerbations, whatever.—Fifteen years afterwards, however, Dr. B. appears to have remodelled his plan of treatment, as the following passage evinces—

“ Considering,” says he, “ that obstructions of the liver very frequently show themselves, in the common fevers of this country, and may with great reason be suspected, in a certain degree, *in all*, we cannot hesitate to admit, as an essential and valuable principle, in the cure of fevers, *the introduction of mercury into the system, so as to affect the mouth in a moderate degree, with the view of removing obstruction, or other morbid affections of the liver; of obtaining natural secretions, and of its thus contributing, with the other means that have been described, to a speedy and permanent cure.*” *Preface to a Collection of Treatises.*

I have thus given a fair view of two very different modes of treatment (and likewise their combination) in this dangerous disease. I have shewn my own preference for one of them, and I think substantial reasons for such: but I do not wish to blindly condemn the others, because I did not find them successful.

He who treads over the same ground which I have done, will, in every probability, have ample opportunities of putting them all to the trial, and then he may

decide on their merits. But I would recommend him not to be too sanguine nor condemn a practitioner from a few failures. It has not been my lot to find intertropical fevers so very tractable as some medical officers have, or say they have, found them. Those indeed who are most conversant with disease at the bed-side of sickness are well aware that no fixed rules or general plan of treatment are applicable at all times in fever, or in almost any other disease. But although the *means* must vary, the *indications* may be always the same. Thus I conceive that in those times and places where bark and stimulants proved more successful than depletion in tropical fever, there was equally as great a *derangement in the balance of the circulation and excitability* as where venesection and purgatives were carried to the greatest extent. The great art indeed is to early ascertain the prevailing diathesis both of constitution and climate, and promptly apply the most appropriate Methodus Medendi.

I should be sorry to suspect, much less accuse, any of my professional brethren of *wilful* misrepresentation; but when *young* medical men are setting forth their cures by a *new* remedy, we may at least be allowed to enter that remarkably significant, though apparently paradoxical caveat of Hippocrates, **EXPERIENTIA FALLAX.**

As the cold season approaches, the fever changes from an almost continued to a plainly remittent, and finally, in December, to an intermittent form. From this time, for two or three months, the climate of Bengal is cool

and delightful; the only diseases being viseral obstructions, the sequelæ of the preceding endemic.

It has already been remarked, that this fever, when epidemic among the natives, occasionally commits the most destructive ravages. But the assimilation of their constitutions to the climate, their singularly abstemious habits, and various other causes, concur to shield them, in general, from its violence, so that it appears, for the most part, among this class, as an intermittent, but often of great obstinacy.

I have alluded to the *refrigerating practice*, which they have employed, time out of mind, in acute fevers: I shall now advert to some very efficacious native medicines, whieh they apply to the eure of this disease, especially when it manifests itself in the form of agues, whieh prove exceedingly troublesome to the inhabitants of villages scattered among the marshy, as well as hilly and jungly distriets. Their first objeet is the complete evaeuation of all bilious and sordid colluvies from the stomach and bowels. For this purpose, they have recourse to a blaek purging salt—*Bit-Noben*, or *Cala Neemuck*, a solution of whieh in water is certainly one of the most nauseous potations that can well be eonceived, having an abominable taste, and a flavour resembling rotten eggs, or sulphuretted hydrogen gas. This medieine proves eminently eathartie, and powerfully emulges the liver and its ducts, carrying off vast quantities of vitiated bile, and other offensive feal matter, from the intestinal canal. This being effected

the kernel of a seed, produced by a low, creeping kind of cow-itch (*Cœsalpina Bonducella*) called by the natives, *Kaut-Kullagee*, or *Catcaranja Nut*, is taken to complete the cure.

The kernel is intensely bitter, and possesses the tonic or febrifuge powers of Peruvian bark, in a very high degree. But it has a manifest advantage over the latter; for, instead of producing any constipating effects in the bowels, it, on the contrary, proves mildly laxative. It may be easily conceived that, in a tropical country, where the biliary system is so commonly deranged, such a qualification is of incalculable utility. One of the kernels pounded into a paste, with three or four corns of pepper, and taken three, four, or five times a day, in conjunction with the decoction of *Cherettah* [*Gentiana Cherayita*] is found so generally successful in curing intermittents, that it is adopted by many European practitioners; and will probably, at no distant period, supersede entirely the bark, to which it seems infinitely preferable in a hot climate, on account of the aforesaid aperient quality.

The *Cherettah* is a species of gentian, indigenous in the mountainous countries north of the Ganges, and is to be procured in every bazar throughout Bengal. It possesses all the properties ascribed to the *gentiana lutea*, and in a greater degree than are to be found in the latter root as it comes to us. The decoction of this herb forms a powerful auxiliary to the caranja nut, and their united efficacy in curing intermittents is undisputed.

CAUSES OF THE FEVER.

Drs. Lind and Clark dwell much on the putrefying animal and vegetable substances left on the miry shores of the Hoogly by each retiring tide; attributing a considerable share of malignity to the noxious exhalations arising from this source, during the intervals of high water, both by day and night. The argument is more specious than solid; and perhaps it is not founded on accurate or discriminating observation.

During the months of August and September, for instance, when fevers rage with their greatest violence, the rivers are swelled to the summits of their banks by the inundation, and the volume of water disgorged into the ocean is so immense, that the stream is perfectly fresh, and the flood tide scarcely felt at Calcutta; consequently, the rise and fall are comparatively insignificant. But in May and the beginning of June, on the other hand, when the rivers are shrunk far within their autumnal boundaries; when the heat is excessive; and when the tides are so rapid, that the *bore*, as it is called, rushes up past Calcutta, sometimes with the amazing velocity of *twenty miles an hour*, not entirely stopping till it reaches Nia-serai, thirty-five miles above the capital; then, indeed, at low water, each side of the river presents a broad shelving slope of mud and mire, covered with vegeto-animal remains in all stages of putrefaction,

and disengaging the most abominable stench,—yet no ill effects whatever are produced by such exhalations.

For the solution of this phenomenon, we must look to the tides themselves, which, sweeping along these shores, every flood and ebb, never allow sufficient time for the extrication of that noxious effluvium, which arises from the *stagnant surface* of marshes, either *partially covered*, or just deserted by *annual* not *diurnal* inundations. Such marshes [and jungles which produce a similar effect] spread far and wide in every direction along the banks of this river, during, and for some time subsequent to, the rainy season; to these, therefore, and not to daily overflowed places, are we indebted for all the sickness and mortality we so fatally experience.

Another circumstance may probably contribute its share in correcting these exhalations at the period alluded to. During the inundation, the waters of this river are quite *fresh*, though turbid; whereas, in the dry season, when the tides are strong, a considerable proportion of *salt water* comes up every flood, and renders the stream, even at Caleutta, so brackish, as to occasion smart bowel complaints among those who drink of it at this time. A mixture of salt water with fresh, therefore, does not, as was supposed by Sir John Pringle, increase the noxiousness of marshy exhalations; on the contrary, we find, in this instance, that they are quite harmless, while rising from these extensive shores, when the water is considerably impregnated with marine salt. In respect to the marshes that run back from

the river, they cannot, during the inundation, be more subject to flux and reflux than the river itself. The shores of all inlets and minor streams are under exactly similar circumstances to those I have stated of the Hoogly; and, finally, I may add, that it is the water of *inundations alone*, not tides, that ever bursts over the banks of the Ganges, to cover the adjoining plains; consequently the *marshes* are not subject to diurnal flux and reflux. I have been the more particular on this point, in order to set in a clear light the *validity* of these reasons which induced Dr. Lind, of Windsor, to read the recantation of his medical faith in *lunar influence*, in favour of “*the increased effluvia disengaged from the shores and neighbouring marshes at each retiring spring tide.*” Never was the fable of “dropping the substance to grasp at the shadow” more completely exemplified, than in this instance, which shews that “second thoughts are not always best.” I much wonder that the ingenious Dr. Balfour, while lamenting the defection of his quondam supporter, did not adduce this unanswerable refutation, among others, of Dr. Lind’s hypothesis.

In so luxuriant a climate as that of Bengal, and on so fertile an alluvion as the Delta of the Ganges, we may well suppose, that every spot,—almost every particle of matter, teems with animal as well as vegetable life. As the scale of existence descends, in the animal kingdom, the amazing circle of reproduction and decay is perpetually trodden by myriads of animated beings, whose ephemeral vitality has scarcely commenced, be-

fore it closes again in death! No sooner has the ethereal spark—the “divinæ particula auræ,” deserted its tenement, than the *latter* is resolved, by the heat and moisture of the climate, into its constituent materials, and formed without delay into other compounds:—

“With ceaseless change the restless atoms pass
“From life to life, a transmigrating mass.”

It is during this dissolution of animal and vegetable remains, preparatory to new combinations and successive reproduction, that a certain inexplicable something is extricated, which operates with such powerful and baleful influence on the functions of the human frame.

This exhalation is capable of concentration, or rather accumulation; for when it is detained amid woods and jungles, as at this place, and especially during the rainy season, when there are no regular breezes to dissipate it, and when the beams of the sun are obscured, except at intervals, by dense clouds, it becomes exceedingly powerful, as the annual mortality too plainly proves.

That the exhalation of these miasmata, and their diffusion in the atmosphere, should be greater during the heat of the day than at night, when the air is raw and cold, appears more than probable; and yet an idea seems to prevail, that they arise from fens and marshes principally in the night. “The nature of an unhealthy, swampy soil,” says Dr. Lind, “is such, that no sooner the sun-beams are withdrawn, than the *vapour emitted* from it renders the air raw, damp, and chilling in the

most sultry climates." It is difficult to imagine how dews *descend* and vapours *rise*, at the same time.— Nevertheless, it is certainly true, that the stench emitted immediately after sunset, is much more perceptible to the senses than at any other period of the day. The reason of this is, that the shores and marshes *retain* their heat for some time *after* the rays of the sun are withdrawn, and consequently *continue* to emit vapours, which are not exhaled and diffused through the atmosphere, as by the sun and high temperature of the day; they therefore meet the descending dews and cool air, condensing and forming a thick fog, which hovers over the swamps, accompanied by a noxious and disagreeable odour. To this we must add, that the miasmata exhaled during the day, in all probability descend with the dews of the evening, and by meeting and combining with those that *continue* to be disengaged from their source, must form a concentration highly capable of affecting the constitution. We accordingly find, that four out of five of those who suffer, are attacked, or receive the deleterious principle, at the period above-mentioned.

Experience has shewn that *marsh effluvium*, though by no means so limited as *human*, does not occupy a wide range: at least, it becomes innoxious at a certain distance from its source, in consequence of dilution. The circumstance mentioned by Dr. J. Hunter, and confirmed by subsequent observations—namely, that "the difference of a few feet in *height* gives a comparative se-

curity to soldiers quartered in the same building," will be accounted for by the supposition which I have already stated, viz. *That as the miasms exhaled during the day descend in the evenings, they become more and more concentrated ; till, meeting the exhalations from the still reeking marshes, a dense stratum of highly impregnated atmosphere is formed close to the surface of the earth.* Hence the superior degree of salubrity in the upper ranges of buildings ; and, on the contrary, the extreme danger of sleeping on the ground in such places ; many instances of which are recorded in the writings of Lind, Bontius, &c.

I am the more inclined to believe that vegeto-animal miasmata descend with the dews, and are *then* more formidable than in their ascent by day, from a circumstance that occurred to myself in October 1805.

Having occasion to take a passage from Madras to Calcutta, in a foreign merchantman, at that time, I sat late on deck, one evening after our arrival in the Ganges the vessel being at anchor a mile from the shore, and not a breath of wind moving in any direction. As the dews began to fall, I perceived, all at once, a faint, heavy odour, to account for which I was much puzzled, as there was no breeze to waft any exhalation from the adjacent shores. My reflections, were soon interrupted, however, by a sense of faintness, giddiness, and at length, nausea, with which I was suddenly affected. I immediately went below, not a little alarmed, and fully persuaded that I was seized with the fever, whose ef-

feets I had so much reason to dread. On drinking some warm water, to clear my stomach, I took a dose of calomel and opium, and next morning, castor oil. Although no farther symptoms of fever occurred, yet I felt an unusual degree of lassitude and depression of spirits for some days after I got to Calcutta.

The same is often felt on crossing the pontine marshes in Italy; and Dr. Moseley remarks, that he has felt a *shiver*, while passing the swamps to the west of Kingston, especially near the *ferry*, before the sun had dispersed the vapours.

The following remark of Dr. Lind's is favourable to the supposition of miasmata descending with the dews: “The first rains that fall in Guinea, are commonly supposed to be the most unhealthy; they have been known in forty-eight hours, to render the leather of shoes quite mouldy and rotten.” “It has been further observed, that woollen cloths wet in those rains, and afterwards hung up to dry in the sun, have sometimes become full of maggots in a few hours.” It is natural to suppose, that whatever exhalations arose, and were floating in the atmosphere, previous to the rainy season, would descend with the first showers, on the same principle as the miasmata exhaled during the day descend with the dews of the night.

In the months of September and October, 1799, while the Leopard and Centurion, two of Admiral Blankett's squadron, were working up from Mocha to Juddah, along the Arabian coast, they were considerably har-

rassed (the Leopard in particular) with a low fever not of the remittent type, accompanied with great head-ache, weak, small, and quick pulse, pain at the stomach, and over the epigastic region, frequent bilious vomiting and purging, with uncommon debility and dejection of spirits. The days at this time were oppressively hot; the thermometer generally at 97°; the nights cool. But what was most singular, a copious fall of dew took place every night, *perfectly salt and bitter to the taste*. To this the fever was ascribed; and what corroborated the suspicion was, that the Leopard's crew slept exposed to the nocturnal vapours, and suffered ten times the sickness which occurred in the Centurion.

In the latter ship no medicine was found to check the bilious purging and vomiting so well as calomel and opium. The addition of antimonial powder was afterwards made. When debility only remained, decoction of bark with nitrous acid, was found useful. In some cases, attended with great febrile stricture on the skin, the cold ablutions were used with success. In the Leopard some mortality prevailed.

This view of the subject leads to a practical inference of considerable utility, viz. that when necessity compels us to penetrate through those insalubrious woods, jungles, or marshes, we should select that point of time at which we are *least likely* to meet those miasms, whether in their ascending or descending state. This period seems to extend *from three to six o'clock in the afternoon*; that is,

after the greatest heat of the earth and air, and, consequently, the greatest evaporation; and *before* the condensation and return of such exhalations as rose during the day, and which combine with those still issuing from the heated soil, for some time after sun-set. It is but too well known, that the cool of the morning, of the evening, nay, in many instances, of the night, is generally pitched upon for wooding, watering, and other duties on shore, to the great risk of those concerned in such dangerous occupations.

An attention to the above rule [founded on facts as well as reasoning] would certainly be productive of much good; particularly when it is considered, that the human frame, during the portion of time above alluded to, is, perhaps, better fortified against the impression of marsh effluvium, or other debilitating causes, than at any previous or subsequent period in the twenty-four hours. The seamen makes his principal meal at mid-day; he is then served his allowance of wine or spirits, and if a couple of hours rest is allowed at dinner, his energy and strength are much greater at three o'clock, than early in the morning or late at night. The European may object to this, by observing that the body and mind, recruited by sleep, are most vigorous in the morning. But I well know, from personal experience, that in tropical climates, and particularly during the rainy season, which compels all classes to pass the night between decks, the rest obtained from interrupted, I might say, stifled sleep, is very trifling. Indeed a

general langour, lassitude, and want of appetite prevail till towards noon, when dinner wine, and an hour or two of repose, give a tone and activity to the system, which continue till the evening. This is the time, therefore, when we can resist the agency of marsh effluvium better than at any other, and of course should be selected, especially since it is at this period that the miasmata are most diffused through the higher regions of the atmosphere, and consequently less potent in themselves. The next three or four hours, viz. from six till nine or ten o'clock, appear to be pregnant with danger to those on shore. Within the tropics there is little or no twilight; immediately the sun withdraws his beams [six o'clock] every thing is involved in darkness; dews and vapours fall from the upper regions of the air, and exhalations still continue to spring from the tepid marshes to meet them. At this juncture, therefore, in the places and seasons alluded to, the stratum of atmosphere in immediate contact with the surface of the earth, must be highly saturated with a principle but too destructive to human health and life; and the system is *then*, too, disposed to its reception, in consequence of the exhaustion produced by the heat and labours of the day, and the torpor induced by the coldness of the evenings.

This reasoning will be illustrated and confirmed by the following authentic particulars. In the month of November, 1804, two parties of men, belonging to his Majesty's ship Tremendous, were employed on shore,

at the Island of Madagascar; one party, during the night, filling water, the other cutting wood during the day. Four of the night party were attacked with the endemic fever of the country, and three of them died. The whole of the day party escaped the fever, though exposed to an intense sun, in the laborious occupation of wood cutting.

About two years after this, his Majesty's ship *Sceptre*, in the same place, and upon a similar occasion, experienced a still greater disaster among her watering or night party, to whom the mortality was confined. Some interesting particulars respecting this fatal occurrence, I shall give in the words of the surgeon, Mr. Neill.

"The fever which attacked our watering parties at the Island of Madagascar, bears a striking resemblance to the endemic fever of the west;—like that too, it was not a contagious disease, of which we had the most cogent proofs, and corroborated what we witnessed at a former period. I believe that the exciting cause of this disease was confined to the scite of the watering place, as no person was affected upon the wooding party, though *constantly exposed through the day*. The deleterious effects of nocturnal exposure, were particularly exemplified here, by the disease raging most violently among the marines, who were on shore at night for the protection of the casks, and to whom the mortality was confined. The fever made its appearance among some of the same party who did *not* pass the

night on shore, but in them it was infinitely milder, though similar in type and general symptoms. The watering place was encompassed from the sea by an amphitheatre of hills; and in nearly the centre of this ran the rivulet from which we filled, situated in a *marshy plain*, surrounded with some trees of the palm kind, and a thicket of *jungle*. The wooding place, on the other hand, was a *dry, sandy soil*, though standing equally low, and covered with brush-wood, *jungle*, &c. in the same manner as the other. As the more minute features of the disease are described in the journal, I shall only remark, that it exhibited something of the remittent type, inasmuch as the paroxysms were more conspicuous and violent on alternate days; and on the intermediate, the system seemed less oppressed and more tranquil, with a different cast of features in the countenance; but there never was any thing like an apyrexia. The general treatment adopted in these cases, and which the journal develops, consisted in blood-letting, purging, and exciting ptyalism; the pre-eminence of which practice, several years experience in this country has amply confirmed. My sentiments have been so often expressed on venesection, that I need not repeat them. With respect to purgatives, I have always observed the greatest relief to follow, when they took full effect. That they are beneficial in every stage of the disease, I infer from this;—that the pulse, from being depressed, weak, and void of energy, becomes open, energetic, and bounding to the surface

with a corresponding animation in the countenance, after copious catharsis, even in the last stage of debility.

The next and only remedy, where blood-letting and purging do not check the disease at once, in its infancy, is mercury to excite ptyalism. I say ptyalism, for *soreness of the mouth* will not secure the patient in this endemic. In many of the *fatal* terminations, the mouth was slightly affected; but we never were able to excite ptyalism. Wherever this last could be induced, a revolution, as it were, in the whole train of morbid symptoms, instantly succeeded, and a healthy train supplied their place ! This revolution was most strikingly evinced in the functions of the bowels, by the evacuations becoming, all at once, copious and feculent; a circumstance, which previous to ptyalism, no purgative, even of the most drastic nature, could effect."

Although the latter part of this document is foreign to the subject for which it was introduced, yet I trust it will be considered interesting. It is satisfactory to me, since it strongly corroborates what I have advanced lately on the treatment of the Bengal endemic, both in respect to bleeding and ptyalism; the former being rather *heterodox* in India. I have only to remark, in reference to the striking coincidence of our practical views, that the above document was never penned for my inspection, nor that of the public. The sensible and well informed author of it (Mr. Neill) is alive, and can contradict any misrepresentation of his sentiments.

I shall here observe, once for all, that the foregoing remarks will equally apply to all other documents and narratives introduced into this essay, in addition to my own personal observations. They are strictly authentic; being the spontaneous records of facts, commemorated without preconceived theory or preconcerted design. I need not say how much their value is enhanced by this consideration.

In the account of the Batavian endemic, some other striking instances, corroborative of the opinions here advanced, will be related. In the mean time, the above examples will be sufficient to justify the rules I have laid down, and put future navigators on their guard, where disease and danger lurk in concealment.

And here I cannot help noticing the apathy or impolicy, which still allows Diamond Harbour, the principal anchorage of our Indiamen, to continue backed and flanked by woods, jungles, and marshes, to the annual destruction of one-fourth of the crews of such ships as load and unload at this place! The objection to clearing the Sunderbunds, has been founded on the idea of their presenting an impenetrable barrier to the incursions of an enemy from that quarter; but the government does not seem to be aware, that to secure us from a *domestic* foe, it is by no means necessary, *in this instance*, to throw open the way to a *foreign*. A semicircle of cleared and drained ground, even of six miles in radius, [not a thirtieth part of the Sunderbunds, and scooped as it were, out of their centre] would sufficiently

protect the anchorage and warehouses of Diamond Harbour, from the baleful influence of those exhalations we have been describing.

That the woods and jungles might be cleared, admits of no doubt; and that the country round Diamond Point might either be drained, overflowed, or submitted to the flux and reflux of the tides, any one of which measures would afford comparative security, can hardly be denied. To add to this security, one or two narrow semicircular belts of wood might be interposed between Diamond Harbour and the confines of the cleared space, to arrest any effluvium disengaged from the surrounding wilds or marshes, and conveyed by the breezes towards the aforesaid anchorage. All writers agree, that marsh miasmata, although much less limited in their range than the matter of contagion, would be perfectly harmless after traversing a much shorter route than that proposed; but where native labour can be so easily procured; indeed, where the convicts alone would be equal to the undertaking in a very few years; and finally when it is considered, that this salutary step opens not any facility to the irruption of an enemy on the southern frontier of Bengal, we can hardly doubt that the attention of the Company will, ere long, be directed to so important a measure. Till then, we can only remark, that the farther from shore, and the lower down the river ships lie, so much more healthy will be the crews. On this account Saugur Road is more eligible, in regard to salubrity, than Kedgeree; and the latter much

less dangerous than Culpee or Diamond Harbour. This was amply proved by the comparative mortality in the Caroline, Howe, and Medusa frigates. The two latter, by anchoring higher up than the former, lost at least six times as many men, from fevers and fluxes. Indeed, one was obliged to take a cruise to sea, and the other to retreat back to Saugur Roads, to avoid depopulation! Some suggestions will be given hereafter, in regard to the means of obviating the effects of marsh effluvium, even at Diamond Harbour, the focus of this destructive principle.

In what manner, or through what channel it is conveyed to the sensorium, so as to produce its effects on the constitution, we are nearly ignorant. A general idea prevails, that the stomach is the medium through which the matter of contagion acts; and, by analogy, that marsh miasmata take the same course. But when we consider, that at each inspiration the atmosphere impregnated with this principle is largely applied to the delicate texture of the lungs, it is not difficult to conceive, that it may pass into the blood, [if it is in any case absorbed] as readily as oxygen. There are, besides, the schneiderian, and other membranes of the nares and fauces, to which it must have constant access, while there is but one way for it to pass into the stomach, viz. along with the saliva or food. Further, when we see this principle, in a concentrated state, produce fever in a very few hours, with high delirium, can we suppose that it enters the system by the circuitous route

of the alimentary canal and lactals? If it be said that it acts through the medium of the nerves of the stomach, why not through that of the olfactory, which is a shorter road? Indeed, from a near view of its *effects*, there is every reason to suppose that the brain and nervous system suffer the first impression and shock. To those *effects*, then, we are to direct our attention.

I believe it is nearly an unanimous opinion, at present, that both marsh and human effluvia are directly sedative or debilitating in their nature. Dr. Rush, indeed, uses the term, "stimulus of contagion" in almost every page of his work on Yellow Fever; but like the more celebrated "stimulus of necessity," it may be quietly laid in the "tomb of all the Capulets." By Dr. Jackson, the cause of fever is compared to electricity. "It seems to accumulate in the system by a regular but unknown process: in a certain state of accumulation, it seems to explode in a manner similar to the explosions of electricity."* The delirium and violent action early apparent in the jungle fever, might countenance the idea of a stimulus, and that the subsequent debility was of the *indirect* kind. I have heard this opinion maintained on the spot, by medical gentlemen; but if we narrowly inspect the train of morbid symptoms, we find more of *irregular* than *increased* action; more of apparent than real strength. If we carefully observe the delirious patient, writhing and struggling under the

* Outlines of Fever, p. 247.

first impression of this cause, we find the efforts not only momentary and less effective than healthy exertions, but accompanied, even at the instant, and immediately succeeded by tremor and other marks of debility. The premonitory symptoms too, are all indicative of decreased sensorial energy. The mind is wavering and unsteady; the appetite languid; the secretions, particularly the biliary, diminished; and the bowels torpid. Notwithstanding the determined phraseology of Dr. Rush, therefore, we may still adhere to the opinion of the venerable Cullen, that marsh, as well as human effluvium, is *sedative*. Dr. Jackson, indeed, will not allow it to be either stimulant or sedative, but a kind of *irritant*; yet he gradually slides into the admission of its sedative nature: "It however appears, from the most general view of things, that the febrile cause is a cause of irritation, disturbing, but *not increasing* in a natural manner, the action of the moving fibre. On the contrary, interrupting, impeding, and as it were suspending the operations essential to health and life; by which means the expression of its effects principally consists in *debility and impaired energy*."^{*}

The space of time which intervenes between the application of this poison to the system and its ostensible operation in the form of fever, depends on the degree of its concentration, and the predisposition of the patient. It will, for instance, be found in some places so power-

* Outlines of Fever, p. 253.

ful, that a man in perfect health, by remaining on shore during the night, in marshy situations, and wet or autumnal seasons, shall have the fever violently the next day, and die on the third or fourth. On the other hand, it may be applied in so dilute a state, as to require eighteen, twenty, or even thirty days,* to bring on fever; and even then, perhaps, only in consequence of some of the numerous predisposing or *auxiliary* causes concurring to enable the *original* to develope itself. If we take the medium of these two extremes, we shall have the ordinary period, viz. twelve or fourteen days, which elapses between the reception of vegeto-animal miasma into the body, and their manifestation, in the shape of actual disease.

We see, then, this important agent greatly varying in force; and from standing occasionally the unaided *principal*,—the “*instar omnium*,” in the production of fever, dwindle away till it can scarcely be distinguished, at least not prominently so, among the train of *auxiliaries*.

Such being the case, is it not probable that where the *latter* are numerous or powerful, they may, in some instances, induce the aforesaid disease, without the assistance of marsh exhalation?—See a valuable train of observations on this subject, in the Section on Yellow Fever of the West Indies, in a subsequent part of this work.

* Dr. Jackson says two months, and Dr. Bancroft nine or ten.

PREDISPOSING CAUSES.

We now come to the predisposing causes, which are entitled to an equal degree of attention with that which has been bestowed on the remote, or exciting.

These may be divided into mental and corporeal. Of the former, none are so conspicuous as the *depressing passions*; and of these Dr. Clark informs us, that FEAR produced the most striking and sudden effects, in aiding the remote cause of fever. This may, in some measure, account for the ravages which the yellow fever commits among those newly arrived Europeans, who are prepossessed with the idea and dread of this terrible scourge.

I have, indeed, remarked that most of those, who were of a timid disposition, and easily alarmed at the prevalence of the endemic diseases of the country, fell under their influence sooner than those of a contrary temperament. But grief, disappointment, and chagrin were the depressing passions which universally induced the most decided and unequivocal predisposition to disease. I saw many strong and melancholy instances of this among that part of our crew, which we impressed within sight of their own shores, and probably of their own habitations, when we were commencing our voyage to India. They were among the first and worst cases which I had under my care, and afforded

ample proofs, that mental despondency can accelerate the attack, and render difficult the cure of intertropical fevers in particular. I have since seen the influence of this predisposing cause on a large scale ;—not on the banks of the Ganges, but much nearer home—on the banks of the Scheldt.

When our army lay entrenched under the walls of Flushing, without any other defence from the sun, the rains, and the dews, than some brushwood or straw;—generally, indeed, with the humid earth for their beds and the canopy of heaven for their curtains; still, with all these disadvantages, the animating prospect of success, the mental energy inspired by *hope*, united with corporeal activity, kept the whole army in health. When Flushing surrendered, however, and another object was not *instantly* held out for pursuit or attainment, a fatal pause took place, and a kind of torpor, or rather exhaustion ensued, during which, the remote cause of fever, viz. vegeto-animal miasmata, began to make some impression. But when from the ramparts of Batz, we clearly discover with our glasses a strong boom crossing the Scheldt from Fort Lillo,—the surrounding country in a state of inundation, and various other insuperable obstacles between us and the “*ulterior objects*” of the expedition;—then, indeed, the depressing passions, and some other predisposing or exciting causes communicated a fearful activity to marsh effluvium, which rivaled in its effects, any thing that has been seen in tropical climates !

It is an old complaint, that the medical topography, and healthy or unhealthy seasons of a country, are too often neglected in military and naval operations. Yet one would suppose that within sixteen or eighteen hours' communication of London, every medical and political expedient would have been speedily devised and applied, on such an emergency as this. But certain it is, that the army did not avail itself of some local advantages that presented themselves among these noxious islands. Walcheren, for instance, is bounded all the way round from Flushing by West Chapel, nearly to camp Vere—two-thirds of its circumference, by a chain of sand hills, from twenty to thirty feet in elevation above the level of the adjacent plains. These hills were not only dry, but open to the westernly winds which blew from the sea, and were then very prevalent. On these, therefore, had the soldiers, who *continued* in Walcheren after the fall of Flushing, been *tented*, the elevated scite, combining with other local peculiarities, would, in all probability, have kept them entirely out of the range of those exhalations which covered the country below.

On the other hand, although Beveland did not present such a favourable situation to the rest of the army, yet, had they been provided with *tents*, the numerous mounds or embankments, which not only defend the island from the highest rise of the Scheldt, but intersect the country in every possible direction, frequently planted on each side with trees, and raised twelve or fourteen feet above the surface of the soil, would

have afforded excellent encampments, where the men, under the immediate inspection of their officers, would have been secured from intemperance and other irregularities, the inevitable consequences of being quartered in towns and villages, often in churches, barns, and other damp, unhealthy habitations, throughout Walcheren and Beveland. But, unfortunately, *tents* were not considered a necessary part of the baggage on this expedition. The French general, too, having opened the sluices, and *partially inundated* the country round Flushing, increased the force of the endemic. Indeed, the road leading from the last mentioned place to Middleburgh, might at this time vie, in respect to insalubrity, with any through the pontine fens of Italy. Lenity towards the *inhabitants* arrested the progress of the inundation before it was complete; policy in guarding the health of *our own army*, would perhaps have suffered it to continue till the cessation of the autumnal heats, and the commencement of cold weather and frost.

Nothing could more clearly prove the limited range of marsh effluvium, than the contrast between the health of the navy and that of the army. Although the ships were distributed all along the shores of Walcheren and Beveland, from Flushing to Batz, most of them within a cable's length of the banks, yet no sickness occurred, except among such parts of the crews as were much employed on shore, and remained there during the nights. Most officers of ships, and many of the

men, were in the habit of making excursions through all parts of the islands, by day, with complete immunity from fever. The night was here, as in sultry climates, the period of danger.

One more remark shall close this digression. We all remember the popular, or rather political outcry, that was made about the scarcity of bark: had the lancet, aided by calomel, and occasionally by jalap, been judiciously, but boldly and decisively employed, the physicians of London and Edinburgh would not perhaps, since that period, have been so often consulted for infarctions and obstructions in the liver and spleen, with many other melancholy sequelæ of that destructive fever!

But, to return. One would suppose that, in a tropical climate, where nature is ever arrayed in her gayest livery, the cloudless skies above, and exuberant fertility around, would conspire to impart a degree of elasticity (if I am allowed the term) and exhilaration to the mind, similar to what we feel in Europe, at the approach of spring or summer. The reverse of this is the case. The animal spirits are, in general, below par; and the same cause of grief or disappointment, which in England would be borne with philosophical resignation, or perhaps indifference, will, in India, greatly predispose to all the diseases of the country, and very probably terminate the mortal career of the unhappy object.

The following melancholy facts, are strikingly illus-

trative of this remark. His majesty's ship Russel (74) sailed from Madras on the 22d. October, 1806, and arrived at Batavia on the 27th November; the crew healthy, and their minds highly elated with the sanguine expectations of surprising the Dutch squadron there. Such, however, was their sudden disappointment, and concomitant mental dejection, on missing the object of their hopes, that they began immediately to fall ill, ten, twelve, or fourteen, per day, till nearly 200 men were laid up with *scurvy*, scorbatic fluxes, and hepatic complaints! Of these, upwards of 30 died before they got back to Bombay, and more than 50 were sent to the hospital there. The Albion did not fare better—the Powerful fared worse: so that, in these three ships only, in the short space of a few months, *full one hundred men died on board*, and double that number were sent to hospitals, many of whom afterwards fell victims to the diseases specified; aggravated, and in a great measure engendered, by mental despondency.

Numerous are the instances of a similar nature, though on a smaller scale, which I could relate; but the above specimen is sufficient. The converse of this position is equally surprising: thus, success or good fortune will as forcibly counteract, as the contrary will predispose to, the malignant effects of climate. A familiar example will elucidate this.—Two ships, under equal circumstances, sail from Bombay, on a five months' cruise off the Isle of France. One of them takes a valuable prize, while the other, with every effort

and vigilance, is quite unsuccessful. The minds of the former crew are now perpetually employed in "building castles in the air," and forming the most extravagant anticipations of enjoyment on their return to port. The ship's company, without the aid of a single bottle of lime-juice, or pot of spruce, will come back to Bombay at the end of the cruise in health. Not so the other: chagrin, envy, (for, after all the *poetical* portraits that are drawn of our noble tars, they are both envious and jealous at times, like other folks) and various depressing passions, shew themselves here, in the ugly shapes of scurvy, ulcers, and fluxes; so that, in spite of all the artificial checks from lemon-juice, sugar, porter, and even NOPAL itself, they are forced to Madagascar for refreshments, or else return with the other ship to Bombay, in a deplorable condition.

Here, however, the scene shifts again; for Hygeia is as fickle as Fortuna. The crew of the successful ship having shared their prize-money,

" Balnea—Vina—Venus,"

become the order of the day; and, for a short time, they are at the summit of human happiness! But in a few weeks, on *leaving* port, this ship's company will exhibit as long a list of fevers, dysenteries, and venereals, as the other did of scurvies, ulcers, and fluxes, on *arriving*. Thus prize-money, or rather the hope of prize-money, is one of the most potent antidotes to disease among

sailors at sea, but the most certain bane of their health on shore.

To return. This mental despondency may be attributed partly to physical, and partly to moral causes. I have already hinted that derangements in the *hepatic* and *digestive*, very soon affect the *mental* functions; so, on the other hand, the depressing passions speedily derange the biliary secretion, digestion, and peristaltic motion of the intestines, consequently disposing the liver, stomach, and alimentary canal, to disease, as well as inducing general debility throughout the system. This sufficiently accounts for the phænomenon; but it is also to be considered, that grief and disappointment must be, *cæteris paribus*, more poignant in India than in England; since the loss of friends or relatives are more felt in proportion to the small number we possess; and frustrated expeetations will, of course, be more galling on account of the previous sanguine hopes which always accompany a foreign, and particularly an Indian speculation. We may therefore lay it down as an axiom, that in a tropical climate, the depressing passions above alluded to, operate more immediately on those organs which, under all circumstances, are the principal sufferers in the diseases of the country; viz. that they diminish the mental energies, or sensorial power, and impair the functions of the liver, stomach, and intestinal canal.

Within the torrid zone, philosophy seems to direct her influence, and reason its arguments, in vain, against

these powerful disorders of the mind! Their frigid tenets are more efficacious beneath the gloomy skies of Europe. Religion, indeed, frequently asserts her superiority here, as well as elsewhere; and in conjunction with some pursuit or employment, mental or corporeal, will be found the best shield against the demon of despair, and, ultimately, the pangs of disease.

The destructive effects of intemperance, as a predisposing cause, are equally conspicuous, and I might say peculiar, in a tropical climate; for the injuries it occasions in Europe, great as they are, bear no proportion to those which we witness in the East or West Indies. Whether spiritous and vinous potations act as stimulants or sedatives, or both in succession, we need not stop to enquire, since the final result is universally allowed to be debility. From the temporary increase of excitement in the system, and energy in the circulation, it is not impossible that the biliary secretion is for a short time augmented, and of course vitiated, by strong drink. This supposition is strengthened by the diarrhoea crapulosa which we frequently observe succeeding a debauch. But the great mischief seems to arise from the torpor communicated to the liver, through paralysis of its ducts, by which the secretion of healthy bile is not only greatly diminished in quantity, as well as obstructed, but deteriorated in quality; and hence the way is paved for fever, dysentery, and hepatitis.

The debility of the stomach, too, occasioned by the climate, is further increased by inebriety; and this atony

is readily communicated to the liver, which bears the onus of disease in all hot climates.

The truth of these observations is amply exemplified among the crews of ships, when they have liberty to spend a few days at Calcutta, or go ashore, indeed, in any part of India, where intoxicating liquors are to be procured. During the indirect debility succeeding these debauches, the endemic of the country or port makes rapid strides among these deluded victims, converting what they erroneously conceived an indulgence, into the greatest evil that could have befallen them.

For obvious reasons, intemperance in eating is little less destructive than the other species; since an over-loaded stomach, which has previously been weakened, will of itself excite a temporary fever, and consequently predispose to that of the country.

That fatigue, especially during the heat of the day, becomes an exciting cause of this fever, is well known to those who have observed its effects among the seamen employed in stowing the salt-petre, or loading and unloading the company's ships at Diamond Harbour. Where those laborious occupations *must* be carried on by Europeans, they certainly should not take place between eleven o'clock and four in the afternoon; the interval ought to be dedicated to dinner, rest, and light work under the awnings.

A very common, and powerfully predisposing cause of this fever, has seldom been adverted to, though highly deserving of attention—I mean those licentious in-

dulgences which are but too easily procured, and too frequently practised on the banks of the Ganges, and in most other parts of India—I may say of all tropical climates! I have seen many melancholy instances of their pernicious effects; and therefore it is incumbent on commanding officers of ships, to keep as strict a curb as possible on the men, during the sickly season, and on no account whatever allow them to straggle through the villages, where ineptiety, and that too from a very deleterious species of drink, is an inseparable accompaniment to the illicit amours abovementioned. In every region virtue is its own reward; but within the torrid zone, its breach is more signally punished than in any other.

The last predisposing cause which I shall mention, is the influence of the sun and moon. However sceptical professional men in Europe may be, in regard to planetary influence in fevers, &c. it is too plainly perceptible between the tropics, to admit of a doubt. I have not only observed it in others, but felt it in my own person in India when labouring under the effects of obstructed liver.

It is a certain fact, that if we attend minutely to the state of our own frames and sensations, two, if not three slight febrile paroxysms, may be detected in the course of each diurnal revolution of the earth, independent of those which succeed full meals. In high health we may not be able to distinguish more than the nocturnal paroxysm, which commences about seven or eight o'clock in the evening, and is not over till two in the morning.

This is the cause of that furred tongue, which all may observe on getting out of bed, more or less, according to the degree of the paroxysm; and it likewise explains the evening exacerbation of fevers in general. But valetudinarians will feel, about mid-day, another slight febrile accession, similar to the preceding, except in degree; and in some instances a third, but still slighter one, is felt between eight and ten o'clock in the morning. In India I have felt the two former very distinctly, and particularly at full and change, when I used to be affected with tremor, a sense of weakness, and sometimes a dimness of vision about mid-day, succeeded by a certain quickness and irritability of pulse, which would continue for an hour or two. I was so well aware of this, that I made a point of keeping myself quiet, and as cool as possible, about the abovementioned period; since any exertion at that time, in the heat of the sun especially, increased the symptoms which I have described, in a very considerable degree. I believe this is the case with most people, more or less, and accounts for the general complaint of faintness about twelve o'clock in the day, and which is relieved by a glass of wine or other refreshment. I found the cold bath, where I could conveniently apply it, almost entirely *prevent* this paroxysm, and hence the utility of bathing when the sun is at his greatest altitude. At those times too, my sleep was broken and disturbed with dreams, and a feverish heat towards midnight, all of which would go off about two o'clock in the morning. This accords with the

general remark, that the morning repose is the soundest, and that if dreams do then occur, they are more distinct and better remembered than those which take place *during* the nocturnal paroxysm. It is very natural to attribute such regular and periodical changes or feelings in the human frame, to the revolutions of the planet we inhabit, and the influence of the sun and moon. That this influence predisposes to, or exacerbates the paroxysms of fever, in India and other tropical climates, is incontestibly proved by daily observation, as the publications of the ingenious and respectable Dr. Balfour evince.

The difference between this and the yellow fever of the West has been always noticed, but, in my opinion, never adequately accounted for; and the investigation of this discordance is certainly interesting, since the same general causes, both remote and predisposing, are allowed to operate equally or nearly so, in both hemispheres. First, then, let me observe, that the average space which a ship traverses, between Spithead and the Ganges, is 14,000 miles. Secondly, that in this voyage we run twice through the tropics; first from Cancer to Capricorn, and afterwards from Capricorn back to Cancer again; besides a great deal of oblique sailing in the vicinity of the southern tropic. During the period of time necessary for this performance, the human frame has the best possible means of accommodating itself to the change of climate; viz. a more steady range of temperature, and of a lower degree, than that of the ulti-

mate destination; together with an atmosphere untainted by any noxious exhalation. In addition to these, the regular hours imposed on all classes, in ships proceeding eastward, the consequent habits of temperance acquired, and lastly, the paucity of luxuries which pretty generally attends a protracted voyage, especially the last weeks, sometimes months of it, all combine to lower the tone of the constitution, and impart to it a considerable degree of assimilation, before the period of danger arrives. Thus the stomach and bowels will become somewhat accustomed to the increased secretion of bile, and even this last will be less profuse, as we are more inured to the high ranges of temperature, following the same laws and sympathising with the perspiration.

Let us contrast this with a transatlantic voyage. The European, "full of flesh and blood," [to use a vulgar, but not inapplicable expression] embarks for the West Indies, in a transport or other vessel, where regularity and order are by no means conspicuous.* As he is under little control, and generally supplies a great proportion of his own fare, he endeavours to guard against any deficiency in that important point; in short, good English viands smoke daily on the festive board, while sufficient potation—"to keep the pores open," is steadily applied; till, after a few weeks run, he is launched at once into a tropical climate, and immediately landed, "with all his imperfections on his head." It is true that, when ashore, the facility of procuring the

* I allude to principally troops.

“*diffusible stimuli*” need not be much insisted on, since unfortunately, the *arrack* of the east is equally easy of access to the men, as the *rum* of the west. But unquestionably the bad effects will be greater in the latter case, for the reasons adduced above.

With respect to officers, and other genteel classes of society, on landing in the western world, they are destitute of many powerful shields which are pretty generally interposed between Europeans of the east and the burning climate. In the former case, we may look in vain for the palankeen, the budgerow, the punka, the tatty, and the light, elegant, and cool vestments of India, together, with the numerous retinue of domestics, anticipating every wish, and performing every office, that may save the exertion of their employers. The untravelled cynic may designate these luxuries by the contemptuous epithet of “*Asiatic effeminacy*;” but the medical philosopher will be disposed to regard them as rational enjoyments, or rather as salutary precautions, rendered necessary by the great difference between a temperate and torrid zone. Nor are these *dulcia vitæ* the exclusive property of the higher classes in India. The European soldier is permitted to intermarry with the native Hindostanee nymph; and, whether married or not, he has generally a domiciliated *chere amie*, who cooks, washes, and performs every menial drudgery for *massa*, in health, besides becoming an invaluable nurse when he is overtaken by sickness.

Under the privation of these advantages, can we

wonder at the effects, which exposure to all those causes, described as operating in Bengal, must produce on the full, plethoric habit of an Englishman, only four or five weeks from his native skies, before he debarks on the burning shores, or insalubrious swamps and vallies of our western colonies.

The more prominent distinctive features of the trans-atlantic fever, yellow skin and black vomit, [though by the bye they are frequently *absent* in this, and *present* in the eastern fever,] may I think be attributed to the more violent action in the hepatic system, and superabundant secretion of *vitiated bile*, which, by the ceaseless vomiting, is thrown out in deluges on the duodenum and stomach, deranging their structure, while regurgitation into the blood suffuses the skin. "On the first and second days of the disorder," says Dr. Rush "many patients puked from half a pint to nearly a quart, of green or yellow bile. Four cases came under my notice; in which black bile was discharged on the *first* day. Three of these cases recovered. I ascribed their recovery to the bile not having yet acquired acrimony enough to *inflame* or *corrode the stomach*. There was frequently, on the fourth or fifth day, a discharge of matter from the stomach, like the grounds of coffee. I believed it first to be a modification of *vitiated bile*, but I was led afterwards to suspect that it was produced by a *morbid secretion in the liver*, and effused from it into the stomach."—"That the bile may become extremely acrid in this stage of

the disorder, is evident from several observations and experiments. Dr. Physick's hand was *inflamed* in consequence of its being *wetted* by bile in this state, in dissecting a body." p. 54. "I am not certain that the black matter which was discharged in the *last stage* of the disorder was *always* vitiated or acrid bile. It was probably, in *some cases*, the matter which was formed in consequence of the mortification of the stomach." p. 55.

In respect to the yellow colour, Dr. Rush is fully convinced that it is attributable to bile. "From these facts it is evident," says he, "that the yellowness, *in all cases*, was the effect of an absorption and mixture of the bile with the blood." p. 70.—*Vide Hunter and Bancroft.*

It is not meant to infer from hence, that the febrifac miasms are exactly the same in the east and in the west; experience proves the contrary, as will be shewn in the Section on Batavian endemic. I only mean to say, that the expression of their effects, on the biliary organs in particular, may be considerably modified by the circumstances above detailed. Neither do I suppose that in the last stages of black vomit, the matter ejected is bilious; but I am confident that the gastric derangement is in a great measure occasioned by the deluges of acrid, vitiated bile, poured from the liver on the stomach, during the vomiting in the early stages of

the disease.* Hence, to check the gastric irritability early, is a most desirable object.

The stomachs of newly arrived Europeans in the West will, for the reasons detailed above, be much more liable also to take on inflammatory action. This, and the more violent orgasm in the hepatic system, appear to be the principal distinctive features in which the fevers of the two hemispheres differ; and are, I think, referrible to the aforesaid causes. These considerations also account for the more decisive system of depletion which is necessary in the western endemic; and for the inutility of mercury till the inflammatory action is completely controlled. In the eastern hemisphere, on the other hand, where the biliary apparatus is very generally in a state of derangement anterior to febrile attacks, the union of mercury with venesection is a rational measure.

In respect to the *yellow colour*, in the highly concentrated endemic fever of the western world, there is reason to doubt its cause being a simply *bilious* suffusion. It would almost appear to be a broken down state of

* The above observations are confirmed by the dissections of Dr. Ramsay, at Bellevue Hospital, in 1803. (Vide Edinb. Med. and Surg. Jour. No. xxxii, page 423.) He traced, in numerous instances, the *black vomit* to the gall-bladder and hepatic ducts; and to this acrid discharge he attributes, in a great degree, the derangement in the stomach and bowels, which gives rise to the *bloody vomit* subsequently.

the blood—or a stagnation in the capillary system, such as we see after contusions.

A practical point of much importance remains to be noticed; namely, whether or not the fevers in question are contagious. It is lamentable to observe the discordance of medical opinions on a question that, at first sight, might seem so easily determined. Thus, Clarke, Lind, Balfour, Chisholm, Blane, and Pym, are positive in the affirmative; while, on the other hand, Hunter, Jackson, Mosley, Miller, Bancroft, and Burnett, are as decided in the negative !

Yet here, as in most other instances, truth lies between the extremes. As far as my own observations and judgment could guide me, I have been led to conclude, that the endemic fevers alluded to, are *not* contagious, till a certain number of patients are confined together, under peculiar circumstances, when the effluvia *may* render them so. If, for instance, a man is seized with fever, from greater predisposition, or from greater exposure to the causes enumerated, than his companions, he will not communicate the disease to another, who may sleep even in the same chamber, where common cleanliness is observed. But on the other hand, if great numbers are attacked, nearly at the same time, and confined in the sick berth of a ship or ill ventilated apartments, in hammocks, cots, or filthy beds, it is possible that a contagious atmosphere may be formed, [without an attention to cleanliness and ventilation, scarcely compatible, or at least hardly

to be expected, in such situations,] which spreads a disease, *wearing the livery of the prevailing endemic*, but having a dangerous character superadded, namely, the power of reproducing itself in other subjects, both independent of, and in conjunction with, the original endemical causes.* This circumstance reconciles the jarring evidences which have long kept the public opinion in suspense. It has been urged, that we ought to err on the safe side, by considering it contagious, and guarding accordingly by early separation. But this plan is not without its disadvantages, and, if I am not greatly mistaken, I have seen it produce what it was meant to prevent; viz. by confining all who had any symptoms of the fever in one place; where, as on board a ship in a tropical, or any climate, it is exceedingly difficult, if not impossible, to prevent the generation of an infectious atmosphere, and the impregnation of bed-clothes, &c. with the effluvia from the diseased secretions and excretions of the patients. On the other hand, I have seen both sides of the main deck nearly filled with fevers of the country, where screens and other means of separation could not be obtained, or rather, were not insisted on, and yet no bad effects followed; while under similar circumstances, where there were fewer sick, and all imaginable pains taken to insulate them, attendants have been seized, and other

* Vide the Section on bilious fever, and also what has been said respecting the Corunna fever in the preceeding Section.

symptoms, indicative of contagion and virulence, have arisen, which, while they seem fully to justify the precautions used, were probably owing to them alone. These hints may not be entirely unworthy of attention, inasmuch as they shew us how easily we may be deceived, and how positive we may be in our errors. They likewise shew that free ventilation and cleanliness may in general be confided in, between the tropics where seclusion is inconvenient or impracticable; and that *separation of the sick from one another*, as far as possible, is a duty not less incumbent, than that of cutting off the communication between them and the healthy. There is this advantage attending the former, that alarm is in a great measure hushed, and the depressing passion of fear so far obviated.

Before taking leave of this fever, it will be necessary to say a few words respecting—

INTERMITTENTS.

In those parts of India and China bordering on the Northern tropic, when the sun is in Capricorn, and the cool season sets in, viz. from the middle of November, till the middle or latter end of February, fevers change from the remittent to the intermittent form. Thus at Bombay, Calcutta, and Canton, particularly the last mentioned place, we have ample specimens during the above period, of agues and fluxes. From the Bocca

tigris up to Canton, the river is flanked with extensive paddy grounds intersected and watered in all directions by the minor branches of the Taa and artificial canals. The surrounding country, however, is singularly mountainous; and at this season, has a dreary, wild, and bleak appearance. From these mountains the north-east monsoon comes down with a piercing coldness, which the Europeans, relaxed and debilitated by the previous heats, or their sojourn on the sultry coasts of Hindostan, are quite unable to resist. As the improvident mariner has seldom any European clothing in reserve, adapted to this unexpected exigency, especially if he has been any time in India, we need not wonder that in such circumstances, a great number should be afflicted with intermittents and dysenteries at this season. For many weeks, we had seldom fewer than thirty or forty, often more at one time, laid up with these complaints: they were generally tertians with a few quartans. The apyrexia was tolerably clear, and the bark exhibited in the usual way recommended for similar fevers in Europe, was a certain and expeditious cure, where no visceal obstructions existed. In the latter case, which was but too frequent, mereury, of course, was an essential auxiliary. It is proper to remark, that in two ships of war lying at the Bocea tigris, (the Grampus and Caroline) the bark was entirely expended on the great number of intermittents. In this dilemma we had no other recourse than mereury; and this medieine invariably stopt the paroxysms as soon as the system

was saturated; but it must not be concealed, that three-fourths of our patients, treated on this plan, relapsed as soon as the effects of the mercury had worn off, and this after three, and in a few instances, four successive administrations, so as to excite ptyalism. I attributed these failures to the coldness and rawness of the air, together with the want of proper clothing and defence against this sudden transition from a hot to a comparatively cold climate; very unfavourable circumstances in the mercurial treatment. No ill effects, however, resulted.

In the month of October the weather was so warm, and the nights so cloudless and serene, with very little dew, that many of us slept in the open air at Lintin, an island about twenty-five miles above Macao, where we had tents ashore for the sick and convalescents, as well as the different working parties.

But in November the nights became exceedingly cold; and although there was hardly any thing that could be called a swamp or marsh on the island, yet intermittents and fluxes made their appearance, and continued to increase during our stay, without any very apparent cause, except this sudden vicissitude in the temperature of the air.

There was indeed a very high peak in the centre of the island, the sides of which were covered with thick grass jungle, and over this the winds blew towards the ship and tents. There can be no doubt that hills and mountains arrest the course of marsh miasmata through the air, and when a sufficient quantum of these is col-

lected, they will produce their effects on the human frame, in a similar manner, as if issuing from their original source; especially when the predisposing causes are in great force. Hence we see how miasmal fevers may take place on the summit of *Morne fortune*, or the rock of *Gibraltar*, without any necessity for the supposition that the febrifac exhalation arose from those places themselves. We next moved up to the Bocca tigris, and got into the vicinity of extensive marshy and paddy grounds, which contributed greatly to the augmentation of the sick list.

It is somewhat curious, that a frigate [the *Dedaig-neuse*] belonging to the squadron, which lay in the typa, near the city of Macao, remained perfectly healthy, while we were so afflicted with the diseases above-mentioned. As the crew of this ship was exposed to all the causes, *predisposing and exciting*, which could exist farther up the river, it follows that marsh exhalation must have been here, as elsewhere, the fundamental *remote cause*, that gave origin to the intermittents. At Wampoa, sickness was still more predominant among the Indiamen, than at the Bogue—not so much from any great difference in the medical topography of the two places, as from the vicinity of the former to Canton, to which city parties of the last-mentioned ships' crews were in the habit of repairing on leave, to the no small detriment of their health, from the course of intemperance pretty generally pursued. The great intercourse, likewise, between Wampoa and Canton afford-

ed infinite facility to the introduction of inebriating materials among those who remained on board. The liquor retailed to seamen in China is certainly of a very destructive nature. Its effects have attracted so much attention, that when his Majesty's ships are leaving the coasts of India for China, there is generally an order received from the Admiral, enjoining the officers to guard as much as possible against the introduction of "SAMSOO" among the crews, which, says the order, "is found to be poison to the human frame."—It were a consummation devoutly to be wished, could this injunction be extended to the arrac of India, from which the samsoo only differs in being more impregnated with certain stimulating materials, prejudicial to the stomach and bowels.

The ordinary mode of preparing Samsoo is as follows:—"The rice is kept in hot water till the grains are swollen; it is then mixed up with water, in which has been dissolved a preparation called 'Pe-ka,' consisting of rice-flour, liquorice-root, anniseed, and garlic. This hastens fermentation, and imparts to the liquor a peculiar flavour." It is probable, however, that other more active ingredients are added to that in use among the lower classes at Canton. Bontius, speaking of the dysentery at Batavia, alleges, as "the principal cause of this disease, the drinking an inflammatory liquor called *arrac*, which the *Chinese* make of rice, and the *holothuria*, or what is called *quabbin* in Holland. These *holothuria* have so pungent a heat, that the touch of

them ulcerates the skin and raises vesicles." p. 16. He adds a pathetic remark. "Happy were it for our sailors, that they drank more moderately of this liquor; the plains of India would not then be protuberant with the innumerable graves of the dead!" The same remark might be with strict propriety applied to the arrac of India in general, where, as at Bombay for instance, its pernicious effects are equally conspicuous as at Batavia.

It may at first sight appear singular, that mountainous countries covered with lofty woods, or thick jungles, should give rise to fevers, similar in every respect to those of flat and marshy districts. But the reason is obvious, when we consider that in the first-mentioned situations the surface of the earth is constantly strewed, particularly in autumn, with vegeto-animal remains, and kept in a moist state by the rains, or drippings of dews from the superincumbent foliage. The stratum of atmosphere, therefore, in contact with the ground, becomes highly impregnated with effluvia, which are seldom agitated by breezes, or rarified by the rays of the sun; either of which would tend to dissipate the exhalations. Thus, among the lofty forests and impenetrable jungles of Ceylon, the most powerful miasmata are engendered, producing fevers of great violence and danger. "It is under the branches of these shrubs," [in Ceylon] says Lord Valentia, "that the fatal jungle fever is probably generated. Not a breath of air can pass through; and the confined exhalations from the black

vegetable mud, loaded with putrid effluvia of all kinds, must acquire a highly deleterious quality, affecting both the air and the water. *Travels, vol. 2.*

Generally speaking, however, these hill, or jungle fevers, as they are locally designated, appear in the form of intermittents, especially among the natives, and those Europeans, whose constitutions are assimilated to the climate. Unfortunately, among the latter class these fevers either soon produce, or are accompanied by, visceral obstructions, too frequently terminating in confirmed hepatitis; hence the necessity of checking them as soon as possible, and of using all imaginable precaution in guarding against the remote and predisposing causes. The treatment, of course, must vary, from a simple administration of bark, to its combination with mercury, or the exhibition of the latter alone, so as to keep up a gentle ptyalism for some considerable time. In these elevated situations, far from seas, or even rivers, and entirely out of the reach of tides, the influence of the moon is unequivocally evinced.

"It is by no means uncommon," says Captain Williamson, "to see persons, especially Europeans, who have to appearance been cured of jungle or hill fevers, as they are called, and which correspond exactly with our marsh fever, laid up at either the full or change of the moon, or possibly at both, for years after." This from a non-professional gentleman, is another proof of the sandy foundation on which Dr. Lind's hypothesis, before alluded to, rests; and of the truth of Dr. Balfour's observations.

Analytical Review of a Medical Report on the Epidemic Fever of Coimbatore, &c.—By Drs. Ainsly, Smith, and Christie.

Sec. III.—An epidemic, spreading its ravages from Cape Comorin to the banks of the Cavery—from the Ghauts to the coast of Coromandel, and sweeping to the grave 106,789 persons, presented a noble field for investigation—an unbounded theatre for the acquisition of medical knowledge! But, alas! the richness of the soil seems only to have rendered indolent the cultivator; and a miserable stunted harvest has been gathered from the most luxuriant plains and vallies on which the sun of science ever shone!

1. *Causes.*—Since the time of Hippocrates, *atmospheric vicissitudes* have been deemed insalutary; and Hoffman set them down as the general remote cause of epidemic fever.—The committee believe that Sydenham's "*Secret Constitution of the Air,*" is as good an explanation as can be given. We believe not; but shall not stop here to discuss the point. They, justly, however, remark, that an erroneous opinion has prevailed, that marsh miasmata can only be engendered in low swampy situations, "though it is well known that noxious vapours from woods, especially if thick and ill ventilated, are as certainly a source of the same mischief." This second source was very abundant in several of the ravaged provinces, many parts being so covered with wood, jungle, and

rank vegetation, as to be nearly impervious. Another supposed origin of febrifuge miasmata was in the salt marshes found in the Tinnevelly and Ramnad districts, where the fever raged with uncommon severity. The committee are of opinion, that marshy situations are not sufficient to render fevers epidemic; there is required the super-agency of a close, moist, and sultry heat, with imperfect ventilation. Such an offensive condition of the atmosphere was but too often experienced in several of the low tracts of these districts during the sickly season, and was pregnant with the most baleful consequences. Although great deviations from the natural order of climate are, fortunately, not very frequent in these regions, yet, as in the present instance, they do sometimes take place; and are always followed by disastrous results. Major Orme informs us, that in the month of March the S. W. monsoon broke completely over the western Ghauts, and descended in vast floods over the Coromandel side of the Peninsula, destroying crops just ready to be cut, sweeping away many of the inhabitants, and ultimately, by creating a powerful evaporation during a sultry heat, producing an epidemic disease very fatal in its consequences.

The effects of those miasmata engendered amongst woods and jungles, have been too well authenticated to require additional testimony. As electricity has been said to promote putrefaction in animal bodies, the committee query how far this fluid, which was very

abundant in the atmosphere during the sickly seasons, may not have assisted in producing a distempered state of the air. We think this is a very questionable cause of epidemic.

The predisposing causes of remittent and intermittent fevers are well known to be those which operate by producing debility, as bad diet, fatigue, exposure to cold and damp, grief, mental anxiety, &c. This is illustrated by a remarkable exemption from disease, among the troops stationed at Madura, while the poor inhabitants of the garrison were swept off by sickness. The same was observed at Dindigul, where two deaths only occurred among three companies of troops, while the needy inhabitants of the town were dying by hundreds.

Of the *exciting* causes, the committee considered exposure to cold and damp, while the body had been relaxed by preceding heat, and the solar influence, as the most powerful.

"The heat of the early part of the nights, induced many of the natives to sleep in the open air, by which means they became exposed, while yet perspiring, to the chill fogs and damps of the morning." P. 116.

2. *Nature and Types of the Epidemic.*—This fatal fever did not differ essentially from the common endemic of the country. Its epidemic tendency, on the present occasion, was altogether ascribable to the *causes* enumerated in the preceding section. It is either remittent or intermittent, according to the constitution,

treatment, and season of the year. People by nature delicate and irritable, or rendered so by irregularities, or want of care, are sometimes attacked by the disease in the remittent form, proving bilious or nervous, as the constitution inclines. The same happens to the more robust, when improperly treated, as where bark is given early, and before proper evacuations have been premised. As the season becomes hotter, too, the remitting form prevails over the intermittent. Males suffered more than females, and young people and those of middle age, more than old people and children. The remittent form sometimes makes its approaches very insidiously. The patient feels himself out of sorts for a few days; his appetite fails him; he has squeamishness, especially at the sight of animal food; universal lassitude; alternate heats and chills; stupid heaviness, if not pain in the head. The eyes are clouded; the ears ring; the bowels are invariably constive. In other cases, the enemy approaches rapidly; and rigors, great prostration of strength, vertigo, nausea, or vomiting, usher in the disease.

The first paroxysm, which is often attended with delirium and epistaxis, after continuing an indefinite period, with varying symptoms, terminates in a sweat; not profuse and fluent, as after a regular hot fit of ague, but clammy and partial, with the effect, however, of lowering the pulse, and cooling the body, but not to the natural standard. The latter still feels dry and uncomfortable; the pulse continuing smaller and quicker than

it ought. This remission will not be of long standing, without proper remedial measures. A more severe paroxysm soon ensues, ushered in by vomiting (sometimes of bile,) and quickly followed by excessive heat; delirium; great thirst; difficult respiration; febrile anxiety; parched and brownish tongue. The next remission (if it do take place), is less perfect than the first, and brings still less relief. In this way, if medicine, or a spontaneous purging do not check the disease, it will run its fatal course, each succeeding attack proving worse than its predecessor, till exhausted nature begins to give way. The pulse declines; the countenance shrinks, and looks sallow; the eyes become dim; "*the abdomen swells from visceral congestion;*" the stomach loathes all food, when hiccup, stupor, and low delirium usher in death. Such severe cases, the committee think, were, in general, owing to neglect or blunders at the beginning of the disease.

Intermittents were more intractable, as well as more common. The epidemic was void of any contagious character, except in cases that were allowed to run into the low continued form; and even here, the contagion was circumscribed within very narrow limits. The types were, the simple tertian, the double tertian, the quotidian, the quartan, and the irregular. The following will give some idea of the relative numbers of these forms.—A native detachment at Dindigul, 255 strong, suffered in the following proportion: simp. tert. 30; doub. tert. 26; irreg. 24; quotid. 13; quart. 4.

The quotidian form was well marked, returning at nearly equal periods, often attacking weak constitutions, and leaving but little time for taking the bark. It was more apt to occasion visceral obstructions and œdematos swellings than any other form of the disease. The quartan was rare, but obstinate, and frequently productive of splenic obstruction and dropsy. The irregular was very troublesome, and seemed to correspond with Hoffman's semi-tertian.

The Tamool, or native practitioners, ascribe the epidemic fever chiefly to two causes—a superabundance of moisture in the air and earth, and the bad quality of the water owing to unwholesome solutions. We think there is much truth in their opinions, and have had reason to believe ourselves, that the water, as well as the air, becomes impregnated with morbid miasmata.

Treatment.—On the first appearance of the epidemic, no time was lost in clearing out the bowels by brisk purgatives; and soon after the medicine had ceased to operate, the cinchona was prescribed, observing this rule respecting it, that, the nearer the time of giving the last dose of bark for the day is brought to the period of attack of the cold stage, the more likely will it be to accomplish the purpose intended.—From six to eight drachms of the fresh powdered bark, taken in substance, was commonly sufficient to keep off a fit, especially if given in the four or five hours preceding the paroxysm. Some of the native stomachs could not bear

the powder, unless mixed with ginger, or given in infusion or decoction, with tinct cinchonæ, and conf. aromat. As the bark sometimes constipated, a few grains of rhubarb were added, or laxative glysters used. Thirty or forty drops of laudanum, with half an ounce of the acetate of ammonia, given at the commencement of the hot fit, often had the effect of shortening it, sustaining the strength, and rendering the stomach retentive. When the perspiration begins to flow, the drink ought to be tepid; but when the body is hot and the skin dry, cold water is both grateful and salutary. The bark must be continued for some time after the fever disappears, to prevent recurrence. The committee, as was to be expected from the schools of debility and putrescency in which they were educated, declaimed against purgatives in this fever, “lest they be productive of mischief, by occasioning irritation, debility, and ultimately an obstinate disease—*mindful of the lesson that was taught them in early life, by the writings of the judicious Hoffman.*” &c. We quote this passage, not to say that we think drastic purgatives necessary in the simple form of intermittent, for we know that they are *unnecessary*, and sometimes hurtful; but to shew that the committee were genuine disciples of Hoffman and of Spasm; and consequently, that we are not to look for any thing beyond the spell-bound circle of those fallacious theories!

When the fever, as too often happened, ran its course some days unchecked by medicine, then the case was

altered, for abdominal congestion and visceral obstruction soon took place, and a dangerous state of the disease was induced. In these distressing circumstances, change of climate was necessary, and a course of calomel. When the mouth became affected, some of the most unpleasant symptoms disappeared, and then the bark was administered with more safety.

The committee not unfrequently met with obstinate intermittents, unaccompanied apparently by visceral obstruction, in which bark was unavailing. They sometimes tried with success sulphuric æther in doses of one drachm and a half, taken at the approach of the cold fit; and also full doses of laudanum. The sulphate of zinc did not answer. The Hindoo practitioners have used arsenic in intermittent fevers time immemorial, and entertain a high opinion of its virtues; but the committee do not approve of it much, though it sometimes succeeded when all other remedies had failed. The cold affusion was useful in the hot fits; nay, daily immersion in the sea sometimes proved the happy means of checking agues which had baffled every other exertion. A blister to the nape of the neck will sometimes check the recurrence of the cold fit. A full dose of the *tinct. rhei et aloes*, at bed-time, was found by Mr. Tait, of Trichinopoly, to stop agues that resisted every other remedy. Notwithstanding all our endeavours, the disease will sometimes run on to coma and death.

"In such cases calomel or the blue pill, continued till the mouth is a little affected, even when no obstruction

has taken place, is often found to be of the greatest service.” 145.

On this we shall make no comment; the fact speaks for itself. Alarming bowel complaints sometimes supervene on long-protracted intermittents; not attended with much straining, but of an obstinate and debilitating nature, requiring opiates, weak cretaceous mixtures, and aromatics. They too often prove fatal, especially among the natives.

Œdematos swellings and ascites not unfrequently supervene from pure debility. These, where no visceral obstruction prevailed, were best treated by tincture of squills, ginger, and tinct. cinchonæ, together with frequent friction with dry flannel, and proper attention to the ingesta. But when the bowels were firm, and there was any suspicion of organic derangement in the abdomen, calomel in small doses was conjoined with the squills; or what answered better, the pilula hydrargyri.

This fever coming on patients who had previously suffered from liver affections or dysentery, assumed an alarming and complex form, requiring the nicest management. Bark was here to be used with great caution. Even the infusion and decoction were dangerous, where there was any pain or uneasiness in the right side. A blister, without loss of time, was then applied, and mercury had recourse to.—R. Pil. hydrargyri gr. vj; pulv. ipecac. gr. iiij. opii. gr. fs; fiant pilulæ tres. Sumatur una ter die; resuming the use of the cinchona

as the hepatic symptoms subside. Sometimes the two remedies were combined, where the hepatic affection was chronic and not very obtrusive. An issue in the right side, with bitters and tonics, often proved serviceable. Change of air was superior to all other means, and diet of course required constant attention. Gentle exercise; flannel next the skin, especially where hepatic affections existed; and the most scrupulous attention to the state of the bowels.

When, from the appearance of the symptoms, a fever of the remittent kind is approaching, emetics are improper; in this case, the committee recommended six grains of calomel and six of James's powder to be taken in the course of 12 hours, which will generally produce copious evacuations, and sometimes diaphoresis.

"On the second day, when the paroxysm will, in many cases, be found every way more severe than on the first, no time is to be lost in having recourse to mercury, *the remedy which, at such times, can best be relied on for producing a proper intermission.* Seven or eight grains of calomel, with three grains of camphor, are to be well rubbed together, and made into four pills, one of which is to be taken every three hours during the day. These will often have the desired effect, if continued for two or three days, by producing a desirable change in the habit, and so favourable a remission, that the bark may be given with safety."

If this be not a decisive evidence in favour of the *anti-febrile* powers of mercury on the constitution, we know

not what evidence would carry conviction to the minds of the declaimers against that medicine. It is the more satisfactory, as it comes from the anti-mercurial party themselves, surrounded with the prejudices of debility and putrescence.

The principal native remedies employed by the Tamool practitioners were, white arsenic, about the 15th part of a grain, twice a day; the barks of the Swietenia febrifuga and melia Azadirachta; the Catcaranja nut; the Chukkoo (Amom. Zingib.); the Sison Ammi; bark of the Acacia Arabica, and Tellicherry bark.

While we deplore the want of that enthusiasm which, from such an ample field for observation, would have drawn copious stores of invaluable knowledge, we must still allow, that the report of this committee contains much important matter that may prove food for useful reflection.

We have lately heard it urged, that the causes of intermittent and remittent fevers must necessarily be sought in low and marshy situations; whereas the testimony of unquestionable writers, and this document particularly, proves, that febrific miasmata may rise, under certain conditions, from almost any soil; and what is still more extraordinary, that these febrific miasmata may be carried, by currents of air, to a distance far exceeding what has been laid down by some most respectable writers on the subject. This epidemic of India spread its poisonous breath from South to North, in the direction of the monsoon, and was confidently believed by

the natives to have its sources in the Pylney mountains, whose overgrown woods, unventilated vallies, and stagnant marshes, could not fail to engender a more rapidly dangerous condition of the atmosphere, than that brought about by the same general causes on the drier and less woody plains of the eastern ranges of the Peninsula.

The observations of the committee are corroborated by the testimony of others, particularly Zimmerman and Jackson.

"Fevers of this sort (says the latter) arise in particular countries, or districts of a country. They travel in certain tracts: sometimes confined to narrow bounds; at other times they are more widely diffused."—*Medical Dep. Brit. Army*, p. 212. See also Zimmerman's "*Experience*," vol. ii. p. 155.

It is greatly to be lamented, that some of the energetic modes of treatment lately introduced into the *methodus medendi* of fever had not been tried in the remittent forms of the eastern epidemic. It does not appear that a lancet was wet in any part of the epidemic range from Cape Comorin to the Cavery; and therefore it is in vain for our Oriental brethren to say that it would not have been useful, when they never gave it a trial. The evidence, however; in favour of *Mercury* is most unequivocal, and will probably silence, if any thing can, the clamour which has been raised against it in this country.

Observations on the Fever prevalent in the province of Guzerat, with general remarks on the action of Mercury in the Diseases of India. By A. GIBSON, Bombay Medical Department.

SEC. IV.—It is now pretty generally known, that, in the fevers of India, mercury alone is to be relied on in the early treatment, to obviate immediate danger—It may be supposed to have three modes of action: *1st*, On the hepatic system; *2dly*, On the intestinal canal; *3dly*, On the general constitution.—Probably all these modes of action are essential to a perfect cure; and if either is deficient, the certain consequence is death, or chronic obstructions, which only yield, if ever, to a change of climate.

1st, If the liver is not acted on, it must, from the determination of blood to it, during the increased febrile action, be in great danger of being disorganized, or of its penicilli becoming consolidated, as a termination of the inflammatory state.

2dly, If the bowels are torpid and constipated, the liver will still be in the same danger; for though it may be pervious and active enough to eliminate bile from the blood sent to it in the healthy state, and in the moderate action of the system, yet during the continued accessions of fever, it may be overpowered by the increased sanguineous afflux, which must either augment, or continue stationary, as long as the alimentary canal refuses to be

moved by such means as would reduce or abate the volume of circulating fluid.

3dly, I have commonly observed the cure to be incomplete, unless the general constitution was affected; for such is the type which the fever very frequently assumes, that, unless counteraction is excited in the system, by the specific power of mercury, the healthy state both of the liver and bowels is inadequate to a cure; the paroxysms become continued; the febrile state is established, and in progress of time irremediable debility follows.

The species of fever, which I have seen prevailing in the province of Guzerat, partakes chiefly of the typhoid character, though commonly denominated, I presume incorrectly, bilious. It differs from the latter form of fever in requiring less evacuation; and from the former, in the remission being such as to admit of stimuli being administered. The effects of stimuli are what one would look for in an inflammatory diathesis; yet excessive evacuations of any kind seem only to hasten the fatal termination.

The affinity between the constitutional symptoms, at the period either preceding the attack of fever, when the patient has been long languishing and unwell, or consequent to it, when the mercury has acted imperfectly, and hectic fever, cannot but strike every observant practitioner. Irregular accessions of slight rigors, sometimes quotidian, and sometimes not recurring for days, at uncertain intervals; *burning heat of the palms*

and feet, extending up the legs; the feelings and actual heat of the body, always above natural; a quick pulse readily increased by the most gentle exercises; the easy excitement of the system to high febrile irritation, by the smallest meal of animal food and use of wine; the flushed countenance; cold clammy sweatings at one period, and dry, hot, parched skin at another, with emaciation, seem to correspond with the phenomena of hectic. But as the phenomena in question occur without suppuration, we must seek for a cause in the general debilitated state of the system, unless an idiopathic origin is allowed; and although I am not prepared to defend an opinion on this important point, the farther investigation of the subject by others, may substantiate the hint at some future period. A change to a cold climate, if timely adopted, or even to another with fewer natural disadvantages, and if by sea, so much the better, fortunately, in most instances, serves towards a recovery. In the pining state above described, are the majority of those composing the convalescent-list of an European regiment at sickly stations. Among the officers also who embark for England on sick-leave, will be found a very large proportion in a similar state. But the soldier, from his humble situation, has not this resource at command, but must patiently wait till a relief of his regiment takes place, when the only chance of a recovery is in his power; but in this hope how many perish! medicine being now exhausted on him in vain.

Absolute confinement during this unhealthy state of

the body, is not often long endured, the person going about his usual occupation, unwilling to lay himself up in a country where the depressing passions are so predominant, and disease so fatal. But, with a multiplicity of uneasy feelings, and a gradual decay of constitution, yet ignorant where to assign his chief complaint, in sleepless nights and restless days, he lingers on a life of extreme misery, till debility, or fever, or its relapse, compel him to his sick-chamber.

In better climates, the phlogistic state of the system is adverse to the introduction of mercury; but the prudent abstraction of blood happily reduces it to that standard which is most favourable for its action. In India, however, in fever, the disease in which this is most speedily to be desired, the same mean would but in very few cases be admissible; for the debility is so great and instantaneous, as well as the tendency to putridity, that only in the robust new-comer is it, if ever, to be hazarded.*

I have only seen it used beneficially, where local pain indicated inflammation to be going on in the contiguous viscus. This, however, is foreign to the fever which I am describing; for, most commonly, no un-

* The spontaneous haemorrhages which are so distressing in the worst cases, from the nose, mouth, and ears, have always appeared to me to hasten death. Indeed, I do not remember an instance of haemorrhage which did not prove fatal, and without exhibiting the smallest remission, not even before the period when it might with certainty be considered an untoward, and a truly alarming occurrence.

easiness is complained of, but the general feelings of pyrexia; and the low delirium and stupor so soon follow, with the sinking pulse, that no further information is to be accurately obtained from the patient; and dissection generally demonstrates nothing more than the congestion in the brain, usually met with in the fatal cases of typhus.

In this low state of the system, no preparatory steps are required by evacuation, further than the care and attention to the unloaded and free state of the stomach and bowels, so necessary in all fevers. On the contrary, in many instances, so great is the debility, that an early tonic is indicated; for it would seem that debility, as well as a plethoric system, is equally inimical to the specific mercurial action. And if the patient is fortunately invigorated sufficiently in this way to give the mercury influence, and before any organ essential to life is injured, by the strictest nursing and attention afterwards, the recovery is almost certain, all morbid action yielding from the moment ptyalism is brought on. But often during this long low period, when, every effort is making to mercurialize, the quantity introduced, but as yet inactive, is so great, that when the effect is accomplished, such is the profusion of the ptyalism, that the most disagreeable consequences succeed, and a long and precarious period of convalescence. It is therefore a desideratum, the greatest in the treatment of this fever, to know a criterion by which to judge that you have pushed the

mercury to the necessary extent, and no farther. In one instance, where the patient was fast sinking and harrassed with excessive diarrhoea, after long mercurial inunction, and the very large exhibition of calomel, in commiseration of the last moments of one apparently moribund, all further, medicine was desisted from, but such as would give temporary vigour under causes so debilitating, while the skin was yet hot and parched, tongue black and dry, thirst insatiable, and pulse rapid. The effects were marvellous. In twenty-four hours after, the gums were inflamed, and in forty-eight the salivation was begun, and with it all symptoms of previous disease vanished. This I beg it to be observed, was accidental; and, since the same cause did not once occur again, during a long period, among the sick in a large and crowded hospital of one of his majesty's regiments, it may be inferred that a criterion cannot be derived from it. This case, however, afforded a clear illustration of the inactivity of mercury in certain states of the system, and also a useful caution against persevering beyond a certain extent in its use.

No inquiry can be attended with a more beneficial result, if successful, than that which is now pointed out; for so universal is calomel in use, and so sovereign is it in efficacy, above all medicines yet introduced into Indian practice, that, unless administered by rule, and watched strictly in its operation, there is much dread of its getting into undeserved disrepute.

Those of my professional friends in India, who, with myself, have lamented, in so many instances, the futility of medical science, in climates so deleterious, will, I trust, before the conclusion of their valuable services, by their researches into the arcana of disease yet throw light on a subject so very obscure as the diseases of India still are. If, after the system is already saturated with mercury, and in a disease too of the greatest debility and tendency to putrescence, a medicine so very powerful as calomel be persisted in longer, in the vain expectation of effects which will never become apparent, it is not being too rash, perhaps, to pronounce every grain given above a certain quantity to be prejudicial, and when increased to a greater extent, an active poison

It may seem empirical to European practitioners, that calomel should be given, apparently so indiscriminately, in the diseases of India; but in all, either a counter-action to that existing in the system at the time, is supposed to demand its use, or it is rather to be presumed, perhaps, that the inflammation prevailing in many of them is of a peculiar and specific nature, as modified by climate, and will only yield to it. In fevers continued or remittent, and in dysentery and diseased liver, acute or chronic, it may be considered a palladium in medicine; but in the unmixed enteritis, which is too often insidious in its approach, and beyond the skill of the physician when first complained of, it is of very doubtful virtue. The preparations of mer-

cury to be relied on are only the subinuriate and the ointment. The blue pill is perfectly inadequate to any good purpose, and generally quite inert in India. To such as favour this essay with their perusal, it may meet their wishes to be informed of the tonic given in that stage of fever at which mercury was left off. A mineral acid, but above all, the nitric, is that which can with safety be ventured on, and it will be found to disappoint less than any other medicine. The cinchona, and all the class of bitters, only load the stomach, and increase the febrile irritation. Nitric acid is tonic without over stimulating. It is a grateful and cooling beverage to the parched mouth and burning body; it is therefore febrifuge; it is antiseptic, and in these combines the good qualities chiefly wanted at this period. The best test, perhaps, of its pleasant virtues, is the incessant call made by the sickly patient for the acid drink he got when last in hospital.—*Vide Ed. Journal, vol. 11.*

Observations on the nature of the climate, and the Fevers which prevail at Seringapatam; By A. NICOLL, M.D.

SECT. V.—Ever since the British took possession of Seringapatam, their forces, both European and native, have greatly suffered from the insalubrity of its climate. Any investigation, therefore, into the nature of the climate, and diseases which prevail there, becomes peculiarly interesting and important.

The following observations made on the nature of the climate, and the fevers which appeared amongst 700 Europeans and some native corps stationed at Seringapatam for eighteen months, will, I hope, place this subject in a more clear and satisfactory light.

Intermittent fevers are prevalent in every part of the Mysoor country, but are much more common at Seringapatam than in any other; and they vary according to the changes of the season and conditions of the atmosphere. In the hot months of the year, the fever becomes remittent or typhoid; the latter usually of that species denominated by Cullen *Typhus icterodes*.* As the season cools, and the weather becomes more steady and pleasant, the remissions of the fever become more distinct; and as the weather gets what may be called cold, the regular agues are formed. Dysentery is frequently combined, both with remittent and intermittent fevers; but is more common in the cold season than in any other. There is nothing peculiar in the approach of the remittent, much less in the ague. The yellow fever always presented itself in the beginning like a severe remittent, generally with great sickness at stomach, and vomiting of a greenish or bilious matter. A flushing of the face, and a degree of stupor and listlessness; a burning skin; full and quick pulse; frequent respirations, and excruciating pain in the head and loins, were the great pathognomonic symptoms of the disease.

* Synopsis Nosolog. Meth. cl. I. Pyrexia, Ord. I. Feb. Gen. V. Typhus Sp. II.

When at this stage of the disease a stop was not made to its further progress, still greater excitement and irritability of the functions of life came on, and incessant vomiting of a greenish or yellowing coloured matter, delirium ferox, and sometimes dysentery, with great violence succeeded, and, in the course of a few hours, put an end to the sufferings of the patient. On or about the third day of the disease, the yellowness of the body generally appeared; the adnatæ, the neck, breast, and belly, shewed at first the partial transfusion, which became deeper in colour, the higher in violence the disease arose. Though the disease runs its fatal course in a few instances in 48 hours, yet it was generally on the sixth or seventh day that the patient died. This so often happened, that whenever I got my fever patients over these two critical days, I contemplated a speedy solution of the disease at hand.

The four first months of the year are excessively hot, close, and sultry, until the Malabar monsoon sets in, in May. At 5 in the morning the thermometer is generally about 65° , and, at 3 in the afternoon about 94° Fahrenheit. In May and June, by the refreshing showers and breezes wafted from the mountains, which separate the Mysoor from the Malabar country, the climate is rendered tolerably healthy and pleasant. Again it becomes hot and sultry in July, August, and September, but nothing like to the four first months of the year, until the Coromandel monsoon begins, in October, which, by its mild and salubrious influence, soon

effects great and remarkable changes in the air and temperature of the place. At this season, especially in November, the thermometer at 5, P. M. has been so low as 48°, and in the middle of the same day, has risen, to 88°. *I have also frequently observed a difference of 40 degrees between six o'clock in the morning and twelve of the day.* During the hot months of the year, the winds are generally southerly or easterly; in the cold season, they become westerly or northerly.

The *fort*, in which the troops chiefly reside, is in a very low situation, with lofty walls surrounding it, which, in a great measure, prevent the free circulation of air. Besides the barracks, hospitals, &c. for the forces being bad, and highly objectionable, there is an extensive bazar close to them, which, by its filth and situation, becomes no small nuisance to the Europeans.

Other sources of noxious exhalations are abundantly fruitful at Seringapatam. These, together with a moist sultry atmosphere, subject to great changes of temperature, from intense heat to extreme cold, have in all ages, been viewed as the origin of pestilence and death.* In the ditches between the ramparts, and in various parts of the fort, where all the Europeans, and many thousand natives reside, are constantly deposited all the filth and corruption of the place. On the banks of the *Cauvery river*, and in several places of the island, pools, stagnant with offensive and putrid matter, are to be seen. All

* Hippocrat. Op. om. De Epid. Lib. I. c. iii. p. 238.

the mass of animal and vegetable corruption from a population, including Europeans and natives, no less than 90,000, is collected on a small space of ground, the circumference of the island not exceeding three miles. These materials of putrefaction, for about eight months of the year, lie in those repositories which I have mentioned, until the periodical rains of Malabar begin, which, falling in the *ghauts*, run down, and fill the Cauvery river. The filling of this river is always very sudden, and it comes rushing along with great impetuosity; sweeps out all the filth from the ditches; clears away all the impurities, so long stagnant in the island; and leaves the place, for a while, tolerably healthy, and the air cool and refreshing.

With regard to the infectious nature of the yellow-fever, some doubts are entertained, from never observing a single orderly attending those ill with the disease, or any of the other patients in hospital, who were oftentimes indiscriminately mixed together, for the want of room to put our sick and convalescents in, contracting the disease. However, the prevalence of this disease being regulated in its operation by a determined range of atmospheric heat, and, from numerous facts related, especially by that enlightened physician, Sir Gilbert Blane.* I have no doubt but that, under certain circumstances in regard to the constitution of the atmosphere, and the susceptibility of individuals, it may evince an infectious nature.

* Blane, Diseases of Seamen, p. 605.

The persons who were most subject to yellow fever at Seringapatam, where the strong and robust, who had exposed themselves carelessly to the vicissitudes of the climate, and lived irregularly. Those who had been much exhausted by almost habitual drunkenness, and long residence in India, were the first who suffered, and fell victims to the disease. Three instances came under my notice, where, in characters corresponding to the above-mentioned, the powers of life were destroyed in the first paroxysm of fever. Irregularity, drunkenness, and exposure to the changes of the climate, when the body is in a state of perspiration or *indirect debility*, are powerful agents in rendering the functions of life susceptible of morbid associations, or liable to the impressions of the morbid *virus*; yet certain situations, in respect to dryness and ventilation, though equally exposed to noxious blasts or exhalations, make no small change in the prevalence and nature of fever.

APPEARANCES ON DISSECTION.

The anatomical examination of the bodies of those who died of the yellow fever, was made with considerable attention and minuteness; but the appearances of the morbid structure of the most important organs, those connected with the functions of life, and seemingly with the disease, were by no means uniform or satisfactory, nor could they in any instance be applied to the full explanation of the morbid actions, which appeared in the rise, progress, and termination of the case.

Brain,—Always contained in its ventricles a large proportion of serum, and its vessels were generally turgid with watery blood.

Chest,—Seldom shewed much signs of morbid alteration in any of its viscera. Sometimes the *heart* appeared enlarged, and the *pericardium* contained more water than natural. At times larger portions of lymph, or polypi were found in the *venæ cavæ*, right auricle, and left ventricle. The blood was always very dark, and watery, running soon into putrefaction.

Abdomen,—Presented various morbid appearances, slight marks of inflammation on the pyloric portion of the *stomach*, but apparently proceeding from the acrid matters found in it, as the duodenum, which contained nearly similar matters, presented the same appearance. The *intestines* always held large quantities of fœtid matter of various colours. The *liver* was rarely found any-wise diseased, but there was always a large secretion of bile. The *gall-bladder* was always turgid; frequently large quantities of bile were seen floating on the surface of the intestines.* When the bodies were inspected a few hours after death, the bile was *yellow*, but when kept more than twelve hours, it became black and putrid! The liquors found in the *pericardium* and ventricles of the brain, as also in the cavity of the abdomen at times, partook, but slightly, of some of the properties of bile; they were, however, sufficiently clear, as to put

* How came the bile there? Is it not more likely to be an effusion of yellow serum.

it beyond doubt, that the yellowness of the skin, and fluids of the body, in yellow-fever, proceeds from the bile having entered into the circulation, and communicated to them its colour.*

From these facts and observations, I am sorry to say, I cannot derive that advantage and important results to the practice of medicine which might be wished. This branch of medical science, which has for its object the ascertaining the seat and causes of diseases in organic derangements, affords ample fields for the investigation of physicians and anatomists, and can only be perfected by their unremitting exertions.†

The plan which was found most successful in curing the yellow fever at Seringapatam, was that which formed its indications: on, 1st, removing the violence of reaction, and, 2^{ndly}, preventing exhaustion of the system by a recurrence of the fever. When the violence of reaction and inflammatory diathesis were sufficiently manifest, blood-letting was employed, the quantity extracted being regulated by the strength, age and plethoric state of the patient. The appearance of the blood, when drawn, was no criterion whatever. In no

* Blane, Observations on Fevers, Part III. chap. 1.
p. 411.

† Cabanis, Revolutions of Medical Science, translation by A. Henderson, M. D. p. 294.

instance, where general bleeding was had timely recourse to, and the quantity judiciously taken away, did the reaction of the system, the morbid heat, and general irritability of the animal and natural functions, continue unabated in violence. When the disease has just commenced, in any constitution, whether robust or plethoric, or weak and emaciated, if there are symptoms of any inflammatory diathesis, bleeding must be employed.* Small doses of calomel and neutral salts must be exhibited every hour, until the bowels are unloaded of their morbid contents, and the capillaries of the skin opened, and the surface becomes moist. But, along with the exhibition of those medicines, and after bleeding, while the skin is dry, the respirations frequent, and the animal heat 103° or 108° , the cold affusion must be resolutely and judiciously applied, and repeated, until the reaction of the system, and progress of the disease, are arrested. The cold affusion is the most powerful remedy in subduing the fever; and the only preventive against the irritability of the stomach, was keeping the bowels open by small doses of calomel and jalap, or solutions of the neutral salts. As soon as a distinct remission was obtained, it was found absolutely necessary to throw in the bark and wine, and prescribe a very nourishing diet, in order to prevent a recurrence of the fever, which, though subdued, is apt to return again and again, as before. I found the

* Jackson's Treatise on Diseases of Jamaica, p. 31.

bark thrown up by injection into the rectum, a valuable remedy in cases where the stomach was irritable and nauseated it. In intermittent fevers, I have often exhibited it in the quantity of an ounce, joined with a little tincture of opium, in this way, just before the expected return of the fit, and in no instance did it fail of moderating the violence of the fit, if it did not succeed in preventing its return altogether.*

When there was great irritability of the stomach, constant vomiting of greenish-coloured matter, great morbid heat of the skin, delirium, and much exhaustion of the powers of life, the cold affusion, constantly repeated, while the spasmodic constriction of the vessels of the skin continued, and the morbid associations remained, is the remedy to be depended on; for, while it subdues the principle of fever, it invigorates the powers of life, and enables us to clear the stomach and intestines by gentle cathartics and laxative glysters.—These remedies, when judiciously applied in the early stages of fever, will seldom fail indeed to stop its progress, or bring it to a speedier issue; but they are not effectual in preventing its return where the body is again exposed to the cause which first produced it. Bark is the only remedy to be depended on, and when there is any morbid derangement in the *liver* or *spleen*, mercury must be employed. Blisters applied to the *head* and *stomach* were often of great service. When

* Heberden, Commentarii de Morb. Hist. et Curatione, cap. xxxviii. p. 160.

the paroxysm was subsiding, small doses of *opium* and *ether* were given with the most salutary effects. Under the above system of treatment, when the patient was brought to us on the first or second day of the disease, we generally succeeded in producing a final solution of the disease before the fourth or sixth day. When the fever continued beyond this period there was always great difficulty in putting a stop to its progress, if it did not kill the patient then. If the bowels were not kept open, and every slight exacerbation of fever checked by the cold affusion, the disease generally terminated fatally, sooner or later. But when any slight accession or exacerbation of fever was carefully watched and stopped by the cold affusion, applied in one way or another, a considerable remission at last took place, which enabled us to give the bark, and support the powers of life by due stimuli. Carrying the effects of calomel so far as to produce salivation, was never found necessary or beneficial in the beginning of the disease, but often found valuable, in conjunction with the bark, when the disease chanced to vary its type, or continued long, and gave us some reason to suspect the presence of some organic derangement, or dropsical dia-thesis. It thus appears, that the treatment of fever, of whatever kind or form, unaccompanied with organic derangement, is, now-a-days, both as simple and successful in India as in Europe.—*Vide Ed. Med. Journal, July 1815.*

BILIOUS FEVER.

SECT. VI.—This is the grand endemic, or rather epidemic (*morbus regionalis*) of hot climates; and although greatly allied in many of its symptoms, perhaps generally combined with the Marsh Remittent, already described, yet it occurs in various places, both at sea and on shore, where paludal effluvia cannot be suspected.

Notwithstanding that this fever is hardly ever mistaken, by the least experienced practitioner, yet so extremely diversified are its features, by peculiarity of constitution, climate, season, and modes of life, that it is very difficult to give even a general outline of it, without involving apparent contradictions. There are always, however, some prominent symptoms which sufficiently characterise bilious fever, for every practical purpose, which is the chief object in view. These are, gastric irritability—affection of *præcordia*,*—and affection of the head. Rarely will all, or any of these be absent. The other items in the febrile train are by no means constant and regular. Thus the pulse is frequently regular, and sometimes up to 120 or 130 in the minute. It is the same with the temperature of the skin. Often, when mad delirium is present, the pulse will be 86, and the thermometer in the axilla at 96° of

* In the term *præcordia* I always include those viscera and parts immediately below the diaphragm;—the liver, stomach, and spleen, for instance, in the sense of Fernelius, lib. iv. *De Febribus*.

Fahrenheit. The bowels are almost always constipated, or in a state of dysenteric irritation. No such thing as natural stools in this fever are ever to be seen, unless procured by art. Frequently, but not always, yellowness of the eyes, and even of the skin, takes place; and the mental functions are very generally affected, which indeed is characteristic of all bilious diseases. This fever is not near so dangerous as the more concentrated marsh endemics, such as those of Bengal, Batavia, &c. Indeed I have long thought that these last are the bilious remittents of the country, modified and greatly aggravated by the peculiar nature of the local miasmata. However, that they occasionally exist independently of each other, I have likewise no doubt; for we must not let the rage for generalising blind us to facts. My meaning is this; that the fever in question frequently arises from atmospheric heat, or rather atmospheric vicissitudes, deranging the functions or even structure of important organs; and that it is, as Dr. M'Grigor supposes, symptomatic of local affection. Where marsh miasma is added, which is generally the case, then we have the endemic of the place, modified by the peculiar nature of the effluvia, and from which we are not secured but by local habituation to the cause. Residence, therefore, on the banks of the Ganges, is no protection from the miasma of St. Domingo, or Batavia, as will be proved in a subsequent section. See also, what Mr. Boyle says on the Sicilian fever.

With respect to the treatment, I have never found it

difficult, when the means which I have minutely detailed under the head of Bengal endemic, were early and steadily applied. Bleeding, I know, is seldom employed; but I can state that three other surgeons on the station, besides myself, had recourse to venesection in the fevers of India, with the greatest benefit. These were, Mr. Dalziel, late of the Naval Hospital at Madras; Mr. Cunningham, of the Sceptre; and Mr. Neill, formerly of the Victor, latterly of the Sceptre. This is a small band opposed to the host of anti-phlebotomists; but it must be remembered, that the evidence in favor of bleeding is, from its very nature, more conclusive than that which is against it. In the first place, a great proportion of practitioners will be deterred from the use of the lancet entirely, by the current of prejudice. In the second place, a great many of those who do venture on it, will be easily discouraged by any reverse at the beginning, which is sure to be attributed to the heterodox remedy; a striking instance of which will be given hereafter, in the section on "Endemic of Batavia." But on the other hand, those who persevere must be more than mad, if they continue a practice which is not beneficial; and if it is, how must their proofs accumulate! and how solid and experimental must be their nature, compared with those on the opposite side of the question, where prejudice and timidity are so apt to mislead.*

* Since the first edition of this work, the proofs of benefit from venesection in the bilious remittent fevers of all cli-

Finally, my opinion is this:—that when we wish to arrest the progress of bilious fever, “*cito, tute, et jucunde,*” we should in all cases, where the constitution is not broken down by climate, and particularly where determinations to the brain or liver are conspicuous, as they too often are, take one copious bleeding at the beginning, (the repetition must be guided by the judgment of the practitioner) which will very effectually promote the operation of all the succeeding remedial measures, and obviate, in a great degree, those viseral obstructions and derangements, which this fever so frequently entails on the patient.

The following condensed, but clear account of this fever, as it exhibited itself, in all its shapes and bearings, and with no small degree of violence, on the great mass of a ship’s company, will convey a better idea of the disease, and in a more praetical way, than any general desription, however laboured, or however minute. I have only to premise, that the symptoms were carefully noted, and the practiee detailed on the spot, by a gentleman of no mean talent for observation; and although I differ from him on the *exhibition* of emetics, and the *omission* of venesection, it is with regret, as I entertain the highest respect for his abilities and eandour. It will be seen that, in most other points, his practice is nearly similar to what I found most successful in the Endemic of Bengal.

mates have so multiplied, that it is needless to insist further on the propriety of the measure, in this section.

"On the 2nd of March, 1804, His Majesty's ship Centurion dropped anchor in Bombay Harbour, on her return from Surat; at which time the ship's company were in good health. During the next week, the weather was variable—hot and sultry, in general, through the day, alternated with cold damp chills at night, when the dews were heavy, and the land winds keen from the adjacent mountainous coast.

On the 9th of the same month, several men complained of slight indisposition, which we did not consider of any importance, little aware of the distressing scene to which this was an immediate prelude.

*Centurion, Bombay Harbour,
March 10th, 1804.*

Eighteen men complained to me this morning, of having been taken suddenly ill in the night. Their general symptoms were—severe pain in the head, arms, loins, and lower extremities; stricture across the breast, with great pain under the scrobiculus cordis; retching and griping. In some, the pulse intermitted, and the temperature of the skin was increased; others had cold chills, with partial clammy sweats; but all complained of pain under the frontal bone; many of them with white furred tongues, and thirst. A solution of salts and emetic tartar, designed to operate both ways, was prescribed, with plenty of warm diluent drinks. P. M. The solution operated well, both upwards and downwards, in all the patients. Many complain now of pain

in the epigastric region and head, with burning hot skins. Gave them Pulv. Antim. gr. vj. Tinet. Opii. gt. xx, Aq. Menth. uneias ij. hora somni sumend. with warm rice water, slightly acidulated, for drink during the night. The patients to be secured from the land-winds, which at this season of the year are considered very pernicious. Almost all these men had been exposed to the intense heat of the sun by day, and to the influence of the night air, while lying about the decks in their waches. Mr. Brown, the carpenter, was on shore in the heat of the sun to-day, and attacked this afternoon with the fever.

Bombay, March 11th, 1804.

Nine patients added to the list this day. The bilious fever set in with nearly the same symptoms as yesterday, and the same mode of treatment was pursued.

Many of yesterday's patients are very poorly this morning; complaining of severe pain in the head, limbs, loins, and across the epigastric region; with constant vomiting of viscid bile. Prescribed from five to ten grains of calomel, with small doses of antimonial powder, and tinetur of opium, to be taken three or four times a day.

There is little intermission of pulse to-day. In some the skin is cold; in others hot, with insatiable thirst. Tongue, in most cases, covered with a thick white crust. Great irritability of the stomach, and aversion to food. Bowels rather constipated—some have a fœtid bilious

purging. P. M. The calomel appears to allay the irritability of the stomach; while the antimonial powder and tincture of opium keep up a warm moisture on the skin.

Bombay, 12th March,

Ten added to the list this morning, with bilious fever. The symptoms and treatment nearly as before. Some of the patients of the 10th are better to-day, the irritability of the stomach being a good deal allayed by the calomel and opium ; but they still complain of pain in the head and limbs, with great debility. Eyes heavy, and tinged yellow—pulse full—bowels constipated. Prescribed a dose of Natron Vitriolat, after the operation of which, the calomel, &c. to be continued as before.

The emetic-eathartic solution operated well with the nine patients of yesterday (11th); most of them are very ill this morning. They have incessant vomiting of green thick bile, with pain in the epigastric region and head—thirst insatiable. Prescribed the calomel, opium, and antimonial powder, as in the other cases. No delirium has yet appeared in any of the patients ; nor much alteration from health in the pulse. In many, the temperature of the skin very little, if at all increased ; constipation of the bowels nearly a general symptom.

The decks are now crowded with sickness.

Bombay, 13th March.

Eight added to the list this morning, with the prevalent bilious fever. Scarce any heat of skin, or accele-

ration of pulse. *All appear to labour under some hepatic affection, which seems to be immediately communicated to the brain, causing great pain under the frontal bone.** Vomiting, I think, relieves them a good deal. The quantity of bile they discharge is enormous, and of a depraved or highly vitiated quality.

Most patients of the 10th and 11th appear very ill; complaining of pains across the epigastric region, and in the head, with frequent vomiting of bile; tongues swelled and furred—no great heat or acceleration of pulse. The constipation of bowels I relieve by doses of natron vitriol. or calomel and jalap. The calomel, &c. taken from 15 to 30 grains a day, according to the urgency of the symptoms. No appearance yet of ptyalism in any of

* It was from observing this symptom, that I was long ago led to form the *ratio symptomatum* of fever, sketched out in the first section—namely, that independent of the sympathy existing between the brain and liver, the congestion, or as it were, stagnation of blood in the portal circle, causes a greater determination to the brain, whereby that important organ becomes oppressed, and keeps up the train of febrile symptoms. If this cerebral congestion is relieved by bleeding, or any other means, immediate energy is communicated to the heart and arteries--re-action and biliary secretion follow, and the balance of the circulation and excitability is once more restored. Vomiting, as determining to the surface, will produce this effect ; but the gastric irritability is dangerous. Lastly, mercury, as keeping up a steady action in the extreme vessels of the vena portarum, and in all the excretaries, prevents the balance of the circulation and excitability from being again destroyed.

the patients. The thermometer placed in the axilla of several, did not shew more than $96\frac{1}{2}^{\circ}$ or 97° —the pulse not exceeding 88 in the minute.

Many of yesterday's patients (12th) are also very ill. All appear to labour under some morbid affection or secretion of the liver. Two of them much troubled with cough, and spasms in the muscles about the neck, impeding deglutition and respiration. Blisters, with vitriolic æther and tinct. opii. relieved this symptom. The warm bath had no good effect. Pulse nearly natural.

Bombay, 14th March.

Nine added to the list this morning, with the prevalent bilious fever. Two of them were suddenly seized with violent mad delirium, and made a dart to get overboard, but were providentially secured in time. No heat of skin, or acceleration of pulse; but all complain of pain in the head and epigastric region, which emetics and blisters frequently relieve.

Those patients who were first attacked (10th) are very ill; many of them highly tinged yellow; their eyes swelled, and the blood vessels a good deal distended. Pain in the head still continues severe. At night many of them are delirious. The mercurial treatment continued. I tried the bark, with nitrous acid, in several cases to-day; but it did much harm, greatly increasing the irritability of the stomach. The fever seems inclined to run through the whole of the ship's company.

The patients of yesterday (13th) are very ill. The calomel in general sits easy on the stomach, and appears to check the vomiting a good deal. I find doses of the natron vitriol. and emetic tartar cleanse the stomach and bowels better than calomel and jalap.

Bombay, 15th March.

Five men attacked last night; one with violent phrensy, who was in good health a few minutes before. He was all at once seized with mad delirium, and made a dart to get overboard, but was caught. Scarce any increased temperature of the skin or acceleration of the pulse. The delirium was removed by an emetic. P. M. A few have their mouth slightly affected, and are much better, but still complain of pain in the head and right hypochondrium. Our decks are now crowded with sick, and the effluvia intolerable. The ship is daily fumigated. Sent twenty of the worst cases to Bombay Hospital, many of them very ill, and changing yellow.

Bombay, 16th March.

Five men were suddenly seized during the night with violent mad delirium; great oppression at the epigastrium —abdomen distended—perfect loss of memory, and all recollection of their messmates and others around them, mistaking one person for another.—Great desire to destroy their own lives, and the lives of those who held them down.—The pupils of the eyes a good deal dilated, and not inclined to contract when exposed to a strong

light.* All of these evinced a great desire for lime-juice, which I gave them, and which they frequently mistook for porter. But at times it was difficult to make them swallow any thing, as they would crush the vessel in which it was offered between their teeth. When full vomiting was excited, it generally relieved them, by bringing away immense quantities of viscid or vitiated bile. They all complained, at intervals, of pain in the head and epigastric region, but particularly in the right hypochondrium. I bled in one case, tried the cold affusion in another, and the warm bath with purgative enemas in a third, without success.†

* The cerebral and abdominal plethora is here so strongly painted, that I should have considered myself authorised to bleed *usque ad deliquium*, or the relief of the symptoms.

† The quantity of blood abstracted is not mentioned; but it is perfectly immaterial; for unless venesection be carried *usque ad deliquium or the relief of the symptoms*, no possible good can accrue, but even harm. This is a practical fact, well known to those who have tried this remedy in the east. It may be accounted for thus: the portal congestion, from its peculiar position (in a circle of vessels whose circumference is entirely composed of capillaries) places a great portion of the vital fluid at rest, and determines the remainder more particularly to the brain, by which this organ becomes oppressed. Now if venesection be not carried the length of relieving the cerebral congestion, and so letting loose the energy of the brain on the system at large, it is quite clear that we diminish the strength without gaining our object, and consequently retrograde from the proper path. This is not meant to censure the surgeon

Our decks now being crowded with sick, sent 21 men to Bombay Hospital, viz.

11 of those attacked on the 10th and 11th instant; several of them changing yellow, and all of them labouring under hepatic affection, with great pain under the frontal bone.

5 of those attacked on the 12th; not quite so bad as those who were first seized.

5 of those taken ill 13th and 14th.—Symptoms nearly the same.

Tot. 21 in number.

The remaining patients on board are very ill. All complain of pain in the head and liver, with a diseased secretion of bile, and constipated state of the bowels—swelled furred tongues—restlessness and exacerbation at night, with slight heat of skin, thirst, and trifling acceleration of pulse—frequent giddiness and stupor, without the least relish for food. I continue to evacuate the bowels with natron vitriol. or calomel and jalap, and persevere in the mercurial treatment till ptyalism takes place.

whose practice is detailed. Considering the general prejudice against bleeding in India at that time, it would have required no small degree of fortitude to employ so heterodox a remedy under the immediate eye of the presidency, where even success would hardly have supported the innovation.

Bombay, 17th March.

Eight men attacked with fever during the last twenty-four hours: four of them with violent mad delirium; the others complained of pain in the head, loins, lower extremities, and epigastric region, with swelled, tremulous tongues; but no great heat of skin, or quickness of pulse. Some were slightly indisposed for a day or so before; others had no premonitory sensations whatever. They were all well evacuated with the emetic-cathartic solution, or calomel and jalap: I prefer the former, as it acts both ways at once.

Several on board are very ill, without the least appearance of ptyalism; others have their mouths affected, and the bad symptoms disappearing. In the former, I can perceive little or no alteration in the temperature or pulse from a state of health.*

Sent 17 to the hospital to-day; many of them changing yellow, with *pain and fulness about the liver, and severe head-ache.*

Bombay, 18th March.

Six admitted this morning: three with violent mad delirium, which lasted several hours; in the others, the symptoms were milder. All our nurses are now dropping ill, and the fever seems to acquire a contagious character, as it is running through the whole of the

* Is there not great torpor throughout the system here, from the state of the brain?

ship's company.* One of the wardroom officers was attacked last night. We now send them on shore nearly as they are taken ill. *All labour under some affection of the liver, which is immediately communicated to the brain.*

At noon, sent 15 of the worst cases to the hospital; several of them changing yellow. They are generally attacked first in the night, and always experience an exacerbation afterwards, as the evening closes in. No remissions on alternate days; the only amelioration is in the mornings.†

I this day visited all our patients at the hospital. Several of them are very ill—many quite yellow; and all have great pain and fulness in the region of the liver, with constipated bowels. They are treated nearly in the same manner as on board; the medical gentlemen there, placing their whole confidence in a continuance of the mercury. They attach much importance, however, to friction with ungu. hyd. fort. over the region of the liver; giving three grains of calo-

* Although it does not follow that the disease is contagious, because the nurses are taken ill; yet it appears very probable that this fever *became contagious from accumulation.*

† Miasmal fevers, when not very concentrated, often shew remissions on alternate days; till at length, as the season changes, they slide into intermittents. When they are so virulent, however, as to occasion great and sudden derangement, whether of function or structure in important organs, it is needless to say, that such remissions cannot be looked for.

met four or five times a day, in conjunction with small doses of antimonial powder and opium, as occasion requires. Two patients at the hospital are delirious at night.

Bombay, 19th March.

Twelve taken ill with fever since yesterday; most of them attacked during the night. In eight cases it set in with violent mad delirium. Several of them were in perfect health a few minutes before; others had some slight previous indisposition.

Six cases on board have now shewn symptoms of ptyalism, and are greatly relieved in all respects, with some return of appetite. As the spitting increases, the yellowness of the skin disappears proportionally. Prescribed the nitrous acid both to the convalescents, and those now under the mercurial course; a practice much recommended by Mr. George Kier, surgeon of this presidency.

Bombay, 20th March.

Five people attacked since yesterday; two, without a moment's notice, were seized with violent mad delirium.* The other three with symptoms more mo-

* The nature and violence of the attack shew that it could not proceed from *latent* miasmata received previously at Surat. Neither could the fever arise *entirely* from land-wind effluvia here, since the other vessels lying in harbour were not affected. Some people may suspect a

derate; but all with pain in the head and epigastric region. They were treated as already detailed. Sent 18 of the worst cases to the hospital; all labouring under hepatic affection, and many of them very ill. A few more have their mouths affected since yesterday, and are getting better.

Bombay, 21st March.

Ten cases of fever within the last 24 hours. Four of these were men who came on board from the Elphinstone East-Indiaman a few days ago, and were attacked with violent phrensy and convulsive exertions, craving for drink of various kinds. After the spasms were allayed, they complained of pain in the epigastric region and head—tongues swelled—pain in the liver—vomiting of acrid bile†—stricture across the forehead

local cause in the ship's hold, or elsewhere, but no such source is traced by the gentlemen composing the survey. The constitutions of the crew, coming in from the more equable temperature of the sea, were strongly affected by the abrupt atmospherical vicissitudes at Bombay ; and the effects resulting thence were aggravated by the miasmal impregnation of the land-wind by night.

† Did this violent mad delirium arise from the brain sympathising with the liver or stomach, where acrid bile might have been accumulated ? Or did it arise from exhalations conveyed by the land-winds, and acting on the brain ? I am inclined to think that it was owing to both.—Contagion ?

and sinciput—pulse natural. After vomiting, they found themselves much relieved. Prescribed calomel, opium, and antimonial powder, as already detailed. At ten o'clock this morning Lieut. P. was attacked with delirium—pain in his head and epigastric region—tongue swelled, and white,—muttering between his teeth—no heat of skin. He assisted last night in holding several men who had mad dilirium, and probably inhaled the effluvia from their breath or bodies. Two patients, who were convalescing since the nineteenth, and taking nitrous acid, seem inclined to relapse as the soreness leaves their mouths;—mercury again prescribed.

Bombay, 22d March.

Five added since yesterday, with the prevailing fever. All complain of pain in the head and right hypochondrium, eyes and tongue swelled;* the latter covered with a bilious crust—small, hot, bilious evacuations by stool, with great thirst.—*They cannot bear the slightest pressure on the region of the liver.*

I have applied for a medical survey on the state of the ship, to inquire whether or not the fever is contagious, and what is the best plan of arresting its progress.

* This symptom is noticed by Mr. Tainsh, on the coast of Syria (Medical and Physical Journal), and by the Gentleman of Bussorah, who narrates his own case. Transactions of a Society, &c. &c.

Bombay, 23rd March.

A young man in perfect health, who has been ten years in India, while assisting his sick messmate into the hospital boat to-day, was all at once attacked with the fever. Severe pain in the head, epigastrium, and liver, was soon followed by the most violent mad delirium, and incoherent language ; he fancying the people around him were going to murder him.—No heat of skin or acceleration of pulse. This state lasted four hours, and was relieved by a vomiting of foetid, green, acrid bile.

The fever not so prevalent now, and seems to have spent its force, as only one man was seized in the last twenty-four hours. The nights are becoming warmer, which I hope will soon check its progress.

Bombay, 24th March.

Five men attacked since yesterday ; one with the usual mad delirium. All labour under pain in the head, epigastrium, and liver ; with white swelled tongues ; pulse and temperature little increased. Prescribed gentle emetics of pulv. ipecacuan, with plenty of warm diluent drinks, on their first complaining.* After the ope-

* Some change in the administration of emetics is here evident, though no reason is assigned. I think the plan I have recommended, of allaying the gastric irritability by calomel, or calomel and opium, and then procuring copious intestinal evacuations, will be found the safest practice ; as

ration, calomel, opium, and antimonial powder four times a day, with pediluvium.

Pursuant to my request, a medical survey was held on board to-day, by the following gentlemen, viz.

Dr. Moir, of the Medical Board ;

Dr. Scott, ditto ditto ;

Dr. Sandwith, of the General Hospital ;
and myself.

After an investigation and mature deliberation, it was agreed that the following would be the most effectual means of checking this fever, *which appears to be contagious.*†—

“ 1st. To land all the sick at the General Hospital.

“ 2nd. To remove the ship to Butcher’s Island, and there disembark the remainder of the ship’s crew, with their bedding, &c.

“ 3d. To clean, whitewash, and paint the ship throughout ; to fumigate her, and likewise the people’s bedding, with nitrous gas ; and to fire off all the lower deck guns.”

it effectually emulges the liver and its ducts, and prevents, or lessens the abdominal and cerebral congestions ; especially when aided by early venesection.

† “It has never been known,” says Dr. Bancroft, “as I am informed, that a single case of this fever (typhus) had occurred on either side of the Indian peninsula.” *Essay on Yellow Fever*, page 510. If this be the case, and if the respectable gentlemen abovementioned, who had the best means of ascertaining *on the spot*, did not give an erroneous judgment, it follows, that *other fevers* may, under certain circumstances, *become contagious*.

Bombay, 25th March.

Nine cases of fever in the last twenty-four hours. Three, who were in perfect health a few minutes before, were seized at once with mad delirium. Several of those patients, whose fevers were checked at the commencement of ptyalism, and where I trusted the remainder of their cure to nitrous acid, are now relapsing, their mouths being quite well.*

I cannot say much in favour of the acid, though so highly recommended by Dr. Scott and Dr. Kier of this presidency, who give it in all cases during and subsequent to the mercurial course. Those attacked yesterday were gently vomited with ipecac. and warm diluent drunks; after which they took small doses of calomel, opium, and pulv. ant. four times a day, with tepid bathing; a practice much recommended by Dr. Moir of this presidency. Sent eight cases to the hospital—sixteen on board.

* I have expressly remarked, in the second section, that *free and copious* ptyalism is necessary. Where this is brought on in a few days, and especially where bleeding or other evacuations have been early premised, there has seldom so much derangement taken place in the liver, or even its functions, as to require the continuance of mercury. But where no V. S. was employed, and the disease has gone on many days before ptyalism, as above, the action of mercury must be kept up for some time after the fever is checked, till the functions of the liver are completely restored.

Butcher's Island, 26th March.

Pursuant to the decision of the Medical Survey, we this day landed on Butcher's Island our sick, sixteen in number, in various stages of the fever; some with their mouths getting sore, and the bad symptoms disappearing—some in a state of ptyalism and convalescence—and others with all the usual symptoms of the fever, particularly the hepatic affection, head-ache, and yellowness of the eyes and skin.

B. Island, 27th March.

No addition to the list since landing. All those whose mouths are affected have no other complaint than debility. The sick are comfortably situated in the castle, which is well aired and clean.

B. Island, 28th March.

Several patients now convalescent, with sore mouths. One patient very restless last night, with great heat of skin, and pain in the region of the liver, which was relieved by a blister, and calomel bolus, with opium and antimony. Most of the others have hepatic affections, which subside as the system becomes impregnated with mercury.

B. Island, 29th March.

All in progress to recovery; their mouths getting sore.

B. Island, 30th March.

Two men, who were yesterday employed in cleaning the ship, have been seized with fever; but the symptoms are milder than in those formerly attacked on board. Same treatment.

B. Island, 31st March.

Only twelve on the list. Most of them convalescents, with sore mouths.

B. Island, 4th April.

The patients at Bombay Hospital recover very slowly. Almost all of them labour under affection of the liver, with severe head-ache, debility, and want of appetite. They have sent us over thirty cases, for change of air. Two more were attacked yesterday with fever and dysentery; they had been employed in cleaning the ship. After evacuations, the calomel as in the others.

B. Island, 5th April.

Of the 30 patients received from Bombay Hospital, none are worse. They find themselves cooler and more comfortable here. Several have considerable affection of the liver, attended with night fever, which is sometimes ushered in with rigors and cold chills, succeeded by hot skin, thirst and head-ache. Prescribed five grains of calomel, one of opium, and two of antimonial powder, thrice a day; blisters to the part affected. All

my original patients are better, with sore mouths and debility. *I tried the decoction of bark in several cases, but find they recover faster without it.* I also tried the nitrous acid, but cannot say much in its favour. The two patients with dysenteric symptoms have pain in the region of the liver.—The same treatment as the others.

B. Island, 6th April.

The patients from Bombay Hospital recover surprisingly fast. Three of them were highly tinged yellow, which goes off as their mouths become sore. Many have constipated bowels: decoction of tamarinds, with natron vitr. an excellent laxative. A few of the convalescents, as they get stronger, have a return of pain in the liver, for which the calomel is again prescribed.

The dysenteric patients are relieved by the calomel and opium—the tenesmus not near so violent. Mercury continued.

B. Island, 7th April.

The patients from the hospital daily gain strength and appetite; *more particularly those whose mouths are well affected with mercury.*

All the fevers experience a nocturnal exacerbation; in some ushered in with rigors.

In Bombay Hospital this fever runs great lengths. Several patients are quite yellow, with debility—severe pain across the epigastrium, in the head, and in the loins. No great acceleration of pulse; but all are much

worse at night than during the day. Calomel, opium, and antimonial powder, internally, with frictions of the ung. hyd. and frequent purgatives, are the means employed by the physicians of the hospital. They also tried the bark and nitrous acid, with the worst success: it generally occasioned great sickness at stomach, stricture on the surface, and obstructed perspiration, with universal inquietude. Removed 32 cases more of fever to Butcher's Island from the hospital.

B. Island, 10th April

The bilious fever not near so prevalent now, as when we were on board; and in all attacks the symptoms are milder.

The patients from the hospital promise fair; some have dysenteric complaints, which go off as the mouth becomes sorcer. Two fresh attacks, with much pain in the region of the liver, and bilious vomiting. The usual treatment pursued.

Many of those last received from the hospital complain of pain in the head and liver region. Their mouths had been affected at the hospital, but are not so now. The mercurial treatment to be renewed.

Butcher's Island, 14th April.
Thermometer, 90°.

In some of the last 32 patients from Bombay Hospital, the fever seems inclined to run great lengths. Sometimes they appear tolerably well; at others, they labour

under severe pain in the head, epigastrium, and liver, with great debility and aversion to food. I tried the bark in several of these cases, but think it did harm, by increasing the pain in the head, and general inquietude. In other cases I gave small and frequently repeated doses of calomel, with the nitrous acid, which answered the purpose much better. The constipation was best obviated by decoction of tamarinds with natron vitriol.

The patients in the general hospital recover very slowly; and several are extremely ill. The hospital is close, and badly aired; and the men contrive to procure arrac, which they cannot so well do here. I therefore removed over sixteen patients to-day, all very ill; two of them quite yellow, with severe affection of the liver.

B. Island, 16th April.

Most of those last from Bombay Hospital are under the influence of mercury, in which course I persevere. The others convalescing fast.

B. Island, 23d April.

Most of my patients are now in a fair way. We have removed all that are able to bear removal, from the hospital to this Island. They all labour under hepatic affection, and are under the influence of mercury, which I continue.

25th April.

We this day embarked all our sick, 84 in number, and dropped down to the middle ground. All our pa-

tients in rapid progress to recovery, and all under the influence of mercury.

At Sea, 27th April.

Sailed yesterday for Goa. Our patients in a state of progressive convalescence; thirty-two remained behind at Bombay Hospital."

(Signed) *Wade Shields, Surgeon, Centurion.*

The perusal of this narrative cannot fail to excite our interest, and strongly arrest our attention. We observe an unwearied assiduity and perseverance in the Surgeon, with a coolness of observation, and candour of recital, that greatly enhance the value of the document. It bears on its front intrinsic marks of fidelity. There is no finesse or disguise; he tells a plain, unvarnished tale. Few medical men have gone through more trying scenes in India, than this gentleman, of which the above is but a trifling specimen.

The following reflections on this fever may here be allowed.

First, with respect to its contagious nature; I believe that few, who have been much in hot climates, will hesitate to pronounce, that at its commencement, it did not exhibit a single trait of contagion. A ship comes in healthy from sea; and after being a week in port, where no contagious disease prevails, has all at once eighteen of her crew knocked down in one night with fever, and every night afterwards a similar repetition,

more or less, till in a few days—"the decks are crowded with sick, and the effluvia intolerable." From this period it certainly betrays some symptoms of a contagious nature, particularly in the check which it all at once experienced on their landing on Butcher's Island, and in the circumstance of the men who were cleaning the ship afterwards, being the principal sufferers. Add to this, the decision of the medical survey, judging it to be contagious. This corroborates my observation respecting the Endemic of Bengal, and which I believe will apply to most other endemics, as those of Batavia, Madagascar, Johanna, West Indies, &c. namely; that they are never originally contagious in their own nature, but may under peculiar circumstances, acquire that character occasionally, from accumulation, confinement, and inattention to cleanliness and ventilation.

I myself could never see any just cause, why a number of sick men crowded together, should not generate a contagious disease, as well as a crowd of people in health. That the latter circumstance has sometimes happened, will, I believe, be very generally admitted, notwithstanding the opinion of Dr. Bancroft. But be this as it may, the fever in question was a bilious fever, and one of very considerable violence too. Although the season of the year was not that of autumnal remittents, yet the land-winds, in all seasons, and in all tropical climates, are more or less impregnated with miasma; and that these had a considerable share in the fever above described, I entertain no doubt.

2dly; the determination to the liver and brain was here so conspicuous, that it became the prominent feature of the disease; and although not always so unequivocally manifested as in this instance, is ever to be suspected in tropical fevers.

Many of the observations contained in the foregoing narrative, strongly corroborate my ideas on the nature of fevers in hot climates, as detailed in a preceding section. The theory is perfectly applicable to the symptoms of this fever.

In miasmal fevers, the congestions in the head and portal circle were the consequences of impaired energy in the brain and nervous system, as there explained. The same congestions take place here, partly from the same cause (miasmata conveyed by the land-winds and acting on the brain) but principally in the following manner:

The extreme vessels on the surface of the body, and by sympathy, of the vena portarum in the liver, having been excited into *inordinate* action during the intense heat of the day, are suddenly struck torpid by the raw, damp, chilling land-winds; the consequence of which is, that perspiration and biliary secretion are checked; the blood determined inwards, is impeded in its passage through the liver, and accumulation ensues in the portal circle, "which is immediately communicated to the brain," as observed in this gentleman's narrative more than once, and as I have already explained.*

* "It is evident," says Dr. Blane, speaking of fever, "from a number of facts, that the state of the *brain and*

During this period, the bile stagnating in the biliary ducts, becomes viscid; and on the recommencement of a hurried secretion, from emetics or other medicines determining the blood to the surface, often so obstructs the natural passage into the intestines, that regurgitation into the circulation takes place, and tinges the skin yellow. A great deal, however, is forced up through the stomach in a viscid and vitiated state; tending to keep up the gastric irritability, and sometimes to destroy the stomach altogether. This view of the subject explains why the men were almost all seized in the night, and why a nocturnal exacerbation was ever afterwards observed. With strict justice, therefore, and with more propriety, we might denominate the fever in question—"Hepatic," rather than Billious Fever; and with some slight modification, principally in degree of violence, I shall shew, in a future section, that in reality it is, *alter et idem*, hepatitis itself.

3dly, in regard to the treatment. Although as I have before hinted, I differ from this gentleman respecting the exhibition of emetics, and the omission of V. S. yet, it must be confessed, that his success in the end was great, and sufficient to confirm him in the opinion, that the practice was the best that could be devised. In-

viscera depends on that of the external surface of the body; for a free state of the pores of the skin, provided it is general, tends more than any other circumstance to relieve internal pain, and also to take off delirium." 3d ed. p. 358

deed, it was the general practice of the country. It does not appear that any deaths occurred, either on board or at Butcher's Island; and as eighty-two men were removed back to the latter place from the general hospital, and thirty-two left at Bombay, when the Centurion sailed, the whole number sent at different times on shore to the hospital is accounted for, viz. one hundred and fourteen.

Thus out of full 150 cases of this fever, (which it will readily be granted, was no very mild or tractable disease) none died, unless subsequently at the hospital out of the 32 left behind. But if we look to the sequelæ of the disease, resulting from the great hepatic derangement that accompanied the febrile state, there will be some drawback on the otherwise uncommon success of the practice pursued. The utility of early venesection and purgatives is no where more conspicuous than in obviating these disagreeable consequences, as will be fully shewn in the next section, where they had a fair trial.

One thing, however, is certain; and a very important consideration it is, namely, that as the *mercurial treatment unassisted*, was here entirely followed, and implicitly confided in, both on board and at the hospital, so it will require some sophistry in its enemies to explain away these stubborn proofs of its extraordinary power and success.

Had this fever, so strongly characterised by yellowness of the skin, bilious vomiting, head-ache, &c. hap-

pened in the West Indies, or at Gibraltar, or Cadiz, and in autumn instead of spring; and had any new mode of practice just coming in vogue, been strictly pursued, would it not have furnished a pompous communication to a medical board, announcing the agreeable intelligence, that *yellow fever* might now “hide its diminished head;” for that 150 cases of it, in a very violent form, had been successfully treated, *on the new principle*, without the loss of a man !

Into how many delusions have the medical world been drawn in this manner? And what jarring contradictions, and virulent controversies, have resulted from them ! The cause has been elegantly stated near two thousand years ago.—

Omnibus in terris, quæ sunt a Gadibus, usque
Auroram et Gangem, PAUCI DIGNOSCERE POSSUNT
Vera bona, atque illis multum diversa, remota
Erroris nebula————— Juv.

*Fever in His Majesty's ships RUSSEL and SCEPTRE,
on the Coromandel Coast.*

SEC. VII.—In the year 1805, a fever of considerable violence, and of apparently a contagious nature, broke out in the Russel, and was afterwards communicated to the Sceptre, on the Coromandel coast.—It went nearly through both ships' companies. In the Sceptre it was most ably combated by my friend, Mr. Cunningham, who bled boldly and decisively, till the symptoms were mitigated; this and continued catharsis were almost the only means employed to subdue the fever; after which, the strength was recruited with bark. The general symptoms of this fever were as follow:—

The attack was, for the most part, sudden, and without premonitory sensations. Many dropped down upon deck, as if they had been shot through the head; and on recovering a little, expressed a sense of violent head-ache, most commonly confined to the forehead and orbits of the eyes, with oppression on the præcordia. They all complained of giddiness, and great prostration of strength, which occasioned them to totter in their walk. Rigors and chillness then ushered in the disease. The patient always complained of the most excruciating pain in the back, loins, and extremities—frequently of the breast, abdomen, and shoulders. The countenance was sometimes

pale, dejected, and collapsed; but in nine cases out of ten, there was a fulness of the features, a flush in the face, with a redness in the eyes, which appeared enlarged and projecting, with a sense of pain and dimness of vision. The state of the tongue was very variable: in some quite natural, in others dry; in some it was covered with a white, in others a yellow, slime or mucus. In all cases, where the disease was not checked by the third day, it became extremely foul. Whatever was the state of the tongue, the patient always complained of great thirst, want of appetite, and impaired digestion. There was equally as great variety in the pulse: in some it was nearly natural—in some strong, frequent, and full; in others slow. In general, however, it was both more full and frequent than in health. The skin was always dry and constricted; the temperature, in general, greatly increased. The bowels were sometimes costive, and sometimes loose; nausea and vomiting very common. These were the leading features of the disease; and the treatment was simple, but successful. *Blood was taken till the symptoms were mitigated, whatever the quantity might be; and repeated whenever they returned.* Full and free catharsis all this time was kept up; and when nothing but debility remained, bark and tonics confirmed the cure. In the Russel, where the same fever prevailed, the treatment was as different as the success. The surgeon was attacked himself; and great numbers were sent to the hospital at Madras,

where the ship then lay. The disease was afterwards got under, however, by the prompt exertions of Mr. Edman; but the ship's company felt its effects for years afterwards, and many a victim fell at its un-hallowed shrine.

In the Sceptre, as it was generally checked in a very few days, the consequences were not near so lasting as in the other ship's company.

It is quite evident, that this fever was of a very different stamp from that described in the last section, as "Bilious Fever;" the climate, season, and all other circumstances, were different. It evinced a contagious character from the beginning, in the Sceptre. In the Russel, I have good reason to believe, that it was generated, in consequence of great negligence and filth, in various departments. But it soon acquired the power of propagating itself in the best regulated ships. On the Russel's arrival in Madras Roads, (from a cruise off Ceylon, where the fever broke out) the disease was pronounced by a medical survey to be contagious.* But further proofs of this were soon exhibited. Some caulkers having been lent at this time, from the Sceptre to the Russel, were seized with the same fever that prevailed in the latter ship, shortly after their return to their own. Soon after this, again, the disease spread in the Sceptre's ship's company, and in particular directions from its origin; at last affecting some of those

* I was in Madras Hospital myself at the time.

officers who were most exposed, from local circumstances, to its influence; among others, the medical officers and nurses. The Sceptre, however, put to sea, and kept cruising on the Coromandel coast, between Madras and Vizagapatam, which doubtless mitigated, in some respects, the fever.* The determination to the

* When I say that the fever was generated in the Russel from filth, and became contagious afterwards, from the crowding and dirtiness of the sick, I only state the opinion of the medical gentlemen who surveyed the ship and crew at Madras. But I do not wish to enter into controversy with Dr. Bancroft, who has taken such pains to establish, of late, that *under no possible circumstance*, can the crowding of men, in sickness or in health, generate a contagious fever or render another so. I have read with great impartiality, (perhaps with some bias in favour of the author, from the great congeniality of our sentiments on most other subjects) his arguments and elucidations; but I cannot say that conviction has followed. I shall only quote a single passage from one of the ablest of the Anticontagionists, Dr. Ferguson, who after stating that "under *ordinary* circumstances of ventilation, they [yellow fever, bilious remittent, and bulam] are not contagious," goes on thus:—"Under the *contrary* circumstances I have no doubt but that a *typhoid infection* may exist here [West Indies] the same as elsewhere, which, however, is certainly dissipated as soon as ventilation and purity are restored. Some well marked cases of *typhous fever*, and others of a *mixed* nature, have lately been sent to the hospital from the huts in the rear of the barrack of the Queen's regiment, into which the married people of that corps crowded in great numbers." *Med-Chir. Tran. vol. viii. p. 152.* I have avoided quoting

liver, and the gastric irritability, were not here very conspicuous; but in the Russel, where early venesection, and copious intestinal evacuations made no share of the cure, these symptoms were by no means rare.

The medical narrative shews throughout the whole progress of the disease, that its features were those of the case of the CHILDERS from this distinguished Physician, where he says, "The fevers on board of her from crowding below decks when at sea, ceased to be yellow ones, and became as truly *typhoid* as any I ever saw," because in a subsequent correspondence with Dr. Bancroft, he endeavours to explain away this passage; but among the neutral party it will surely have its weight. Granting that he proves the local origin of the Childers' fever in the hold, how will he explain the circumstance of its *ceasing to be a yellow fever?*

In respect to the propagation of the fever in the Sceptre, Mr. Cunningham, a decided anticontagonist, has related the above particulars himself; and while he is unwilling to allow, does not attempt to deny contagion. These simple facts do not accord with the following, I think, hazardous sentiment of Dr. Bancroft, *Essay, page 701.* "The high temperature between the tropics is so unfavourable, I need not say to the generation, but to the *existence* of febrile contagion, that, even when it happens to be brought into that temperature, *it cannot subsist, much less propagate itself.*" The remainder of this note in my first edition having given rise to an *expostulation* on the part of Dr. Bancroft, I have cancelled it. The facts on both sides of the question will ultimately prevail over arguments.

contagious fevers. And if we can safely bleed in such cases, why not in endemic fevers, where the symptoms are still more violent, and the visceral derangements more frequent, and earlier in their appearance?

ENDEMIC OF BATAVIA.

SEC. VIII.—The following, as it is the most recent, so, I think, it will be found the most accurate and detailed account, of the Batavian Endemic, that has yet appeared in an English dress.

In the month of June, 1800, His Majesty's ships Centurion, Dædalus, La Sybille and Braave, having on board a detachment of the 12th regiment, consisting of 127 men and officers, sailed from Madras, on a secret expedition; and on the 23d of August following, the squadron anchored in Batavia Roads. The Centurion and Dædalus were placed about four miles from the garrison, to blockade the port; the Sybille kept constantly shifting about, to interrupt the approach of small vessels to the city; and the Braave lay at anchor under the small island of Onrust, about three miles from the main land of Java.

During the first few weeks, the squadron continued tolerably healthy, and without any deaths; although the crews were much harrassed by night and by day, in chasing the enemy's vessels, rowing guard, and loading or unloading the prizes off the island of Onrust*. The

* Contrast this with what happened to the crews of the Russel, Albion, and Powerful, at the same place, in 1806, when their sanguine hopes of surprising the Dutch squadron were suddenly dissipated. *Vide sec. 11.*

weather was pretty temperate at this time; the thermometer, in the shade, generally ranging from 82° to 87°, with regular sea and land breezes. When the latter, however, came off from the low, swampy grounds about Batavia, early in the mornings, it brought with it a thick mist, accompanied by a very foetid smell; all of which would gradually go off, as the sun rose, and the sea breeze set in. During the prevalence of this foetid mist in the morning, many people would complain of slight indisposition in the head and stomach, which likewise went off as the sun came out.

About this time the Braave disembarked an officer and some men of the 12th regiment, on duty at the island of Onrust, where a temporary hospital was established; and here the first appearance of *endemic* fever was observed. It was not, however, in any alarming degree, but chiefly confined to those who lived intemperately; as none of the officers of that ship were attacked, though they frequently slept on shore. Some of the people having broken open a spirit-store on the island, were in the habit of getting intoxicated, in which state they often exposed themselves to the intense heat of the sun, by day, and the damp, cold dews of the night. A few of the 12th regiment fell victims to fever, much aggravated, if not occasioned by irregularity; in consequence of which, an idea was very generally propagated, that the island was peculiarly unhealthy.

On the 14th September, the Centurion relieved the Braave, and took charge of the hospital, where twelve

cases were left behind, most of them very ill, some of whom died. Prepossessed against the island, the surgeon of the Centurion declined landing any of his own sick there, at first; till, finding that some of the Braave's, who were exceedingly ill, recovered, and that none of the nurses were attacked at the hospital, he ventured to land six of his worst patients (bilious remittents and fluxes,) who all did well. He therefore became convinced, that the reported insalubrity of the island was unfounded, in a great measure, at least.

Unfortunately, however, the commanding officer of the expedition, conceiving that the vicinity of the island to the main land was the cause of sickness, (which supposition seemed corroborated by the foetid mists that daily came off from thence to the island) ordered the sick to be removed, on the 28th September, to the small island of Edam, situated nine miles out to sea; a circumstance that he thought must insure its salubrity. Here the tragic tale commences;—but first let us glance at the medical topography of the two islands. Onrust is a small island, three miles from the main, well cleared of trees, underwood, and jungle; nearly flat, and free from swamps or marshes, except one very small spot, which, however, is daily covered twice by the tides. On this island there were many excellent buildings, where the convalescents could be separated from the fever cases, and where all could have abundance of space and ventilation. From the foetid exhalations, which were conveyed by the land winds from

the neighbourhood of Batavia, the sick were easily secured, by closing certain apertures in their apartments, till the sun dispersed the vapours in the morning; after which, there did not appear to be any danger from the miasmata disengaged during the day. Edam, on the other hand, though farther out of the reach of Batavian exhalations, is covered with trees, long grass, and jungle, having a part of the Island itself in a stagnant, marshy state. The buildings here were indifferent, and only one long ward could be found, for the sick and convalescents; in consequence of which, the latter class of patients experienced all those dire effects produced by the depressing passions, for ever nurtured by the melancholy scenes of death, which this fatal spot too constantly presented to their view! Thus, in running from a doubtful danger, they precipitated themselves on certain destruction. In leaving Onrust (a cleared space) to avoid the effluvium of Batavia, weakened and diluted by a three miles passage from its source, they settled on the jungly and marshy island of Edam, where pestilent miasmata, in a concentrated form, issued from every foot of ground around them!—The fatal effects which followed, were predicted by an intelligent Surgeon on the spot, but his suggestions were disregarded or overruled; *distance* from the main being held paramount to all other considerations.

Of sixty soldiers (12th Regiment) landed at different times, *in health*, to do duty at Edam hospital, and other buildings on the island, between the 1st October and

12th November, thirty-one died (besides five or six at Onrust, previously.) Of the remaining twenty-nine, embarked on breaking up the blockade (12th November,) twenty-two died at sea; the other seven were sent to Malacca hospital, where all, or nearly all of them, shared the same fate!—In short, only sixty-two returned out of the whole detachment; the rest having fallen ingloriously without drawing a sword!

All the soldiers getting ill on Edam, sixteen marines were landed from the Centurion, to do night duty, as they expected an attack from the Dutch gun-boats. The whole of these were seized with the fever, and thirteen died; two recovered, and one was sent to Malacca Hospital.

The loss of seamen I have not been able exactly to ascertain; but it must have been considerable. Almost the whole of the sick [twenty-eight in number,] who were removed from Onrust to Edam [28th September] died. And as nine Officers, including the Surgeon, Mr. Cornish, who were doing duty at this dreadful island, perished, we may form some idea of the general mortality.

It is worthy of remark, that the Dædalus, in which 25 of the detachment from the 12th regiment were embarked, did not land a man on any of the islands, nor did one of her men die, or suffer an attack of this endemic. Such is the outline of its history; the following are the features of this fever, principally as it appeared at Edam, its head-quarters. They were noted on the

spot, by a very intelligent surgeon of the expedition, who, I believe is now in England, and who had ample opportunities of observing the disease, in all its shapes, as affecting various constitutions.

"The patient, without much previous notice (if the first attack) is suddenly seized with giddiness and cold chills—sense of debility; and vomiting, with pain over the orbits, and in the epigastric region. He frequently falls down, and is insensible during the paroxysm; his body covered with cold, clammy sweats, *except at the pit of the stomach, which always feels hot to the palm of the hand*—the pulse is small and quick. On recovering a little, this train of symptoms is succeeded by flushings of heat—increased pain over the orbits, and in the sinciput—pain and a sense of internal heat about the stomach and praecordia—oppressed breathing—the lower extremities, at this time, not unfrequently covered with cold sweats. The eyes now become, as it were, protruded, and the countenance flushed. Retching, and at length, vomiting of discoloured, biliary matter, comes on—the tongue white and furred—the abdomen tense and full, with pain in the loins and lower extremities. The length of this paroxysm varied from six to eighteen hours, and was generally succeeded by cold rigors—very often low delirium, preparatory to the next stage or paroxysm of the fever. The intellectual functions now become much impaired, the patient not being at all sensible of his situation, or of any particular ailment.—If asked, how he is? he commonly answers,

"Very well;" and seems surprised at the question. This is a very dangerous symptom, few recovering in whom it appeared. In this stage all the symptoms become gradually, often rapidly, aggravated; particularly, the head-ache—pain and tension in the epigastric region, and vomiting. Some patients, *on shore*, were carried off in 18, 24, 30, or 40 hours, and others not till as many days after the attack, especially when removed on board, from the more noxious air of the island. A great proportion changed, in a few days, to a bright yellow; some to a leaden colour: other cases terminated fatally, in a very rapid manner, too, without the slightest alteration in that respect. Generally, however, the change of colour indicated great danger. Vomiting of black bilious stuff, resembling the grounds of coffee, frequently commenced early, and continued a most distressing symptom; too often baffling all our attempts to relieve it. In some, a purging of vitiated bile, or matter resembling that which was vomited, occurred; in a great many, a torpor prevailed throughout the intestinal canal—rarely did any natural feces appear spontaneously. The pupil of the eye was often dilated, and would not contract, on exposure to a strong light—in others there was great intolerance of light:—both indicated danger. Low delirium was a pretty constant attendant on this fever, from first to last; sometimes, though more rarely, raging high delirium. Mr. Carter's was an instance of the latter, which he had in a very terrible degree, with red, inflamed, and protruded

eyes—great inquietude—hot, dry skin—small, quick pulse; his mind actively employed about the stores and prizes on shore, of which he had charge previous to his illness. During the violence of the paroxysm, he was quite insensible to every thing that was going on around him, constantly grasping at, or wrenching those objects within his reach. He made frequent attempts to get overboard. In the low delirium, also, the mind is much occupied on avocational subjects: if a seaman, about the ship's duty; if a soldier, about his regiment, marching, &c. Some patients were comatose from the first attack; in others, the fever was ushered in with convulsions, delirium, and cold sweats, without any intervening heat of the surface, except at the pit of the stomach, which, in most cases, was burning hot to the touch, and accompanied internally by a similar sensation according to the patient's own feelings.

Hæmorrhage from the mouth or nose seldom occurred; in two cases, which terminated fatally, the blood did not coagulate, but tinged the linen yellow. Aphthæ appeared in a few cases, and indicated danger. Subsultus tendinum often attended both on the high and low delirium. The pulse never could be depended on. In the very last stage it has been regular; but, in general, it is small, quick, and either hard or stringy and tremulous; sometimes, during the re-action of the system, full and hard. Deafness was very common, and an unfavourable symptom. Two kinds of eruption appeared about the lips—one such as we often see at the decline of common fevers; the other, con-

sisted of small black or brown spots round the lips, and was likewise a dangerous, indeed a fatal symptom. With this eruption, the teeth, tongue, and fauces generally become covered with a brown or black crust, and the breath intolerably foetid. Locked jaw took place in two cases at Onrust Hospital, but the patients were insensible of it:—both died. *The brain appeared the organ chiefly affected at first—the stomach and liver in succession.** In those cases which occurred on board, and where the patient had not slept on shore at Edam, the symptoms were much milder, and the fever resembled more the bilious remittent of other parts of the East. A great torpor prevails generally throughout the system, with the low delirium; blisters, medicines, &c. having little effect on the patient, who appears as if intoxicated. When roused, he recollects the person who is speaking to him, for a moment, and answers in a hurried incoherent manner; then lies on his back, his mouth and eyes half open; both feces and urine often passing involuntarily. I have seen them remain in this state for hours—nay, for days together, scarcely moving a single voluntary muscle all that time. In this melancholy situation, Lieut. Neville, of the 12th regiment, lay for some days previous to his death.—Never was there a disease so deceitful as this fever: I have frequently seen instances where every symptom

* This accords with my observation on the Bengal Endemic, and with the mode in which I supposed miasmata to act on the human body.

was so favourable, that I could almost have pronounced my patient out of danger: when all at once he would be seized with restlessness—black vomiting—delirium—and convulsions—which, in a few hours, would carry him out of existence!

This was the case with Mr. Broughton, purser of the *Dædalus*, who died of the Batavian endemic at Edam Hospital. On the seventh day of his illness, he took a change for the better; and every thing was promising. The morning before he died, he expressed himself greatly relieved; and called for some mutton-broth and sago, both of which he ate with a good appetite;* spoke rationally—and was in good spirits. Towards evening the delusion vanished—restlessness—black vomiting—delirium and convulsions supervened, and carried him off before morning! I have seen many cases terminate in this manner. Two patients at Edam complained of a diminished size of the brain, and that they felt as if they could shake it about within the cranium:—both died. Mr. Cornish, Surgeon of the *Dædalus*, who had charge for a while of the hospital, was one; he died on the seventh day of his illness.

The fatal terminations generally happened on the third—fifth—seventh—ninth—and not unfrequently the eleventh and thirteenth day; if they passed this period, they usually lingered out twenty or thirty days. But very few indeed ever ultimately recovered who had

* Hunger is a fatal symptom in the Yellow Fever.

slept on shore, and were attacked at that dreadful island, Edam! No constitution was exempted from the assault of this fever. It seized with equal, or nearly equal violence, on those who had been many years in India, and on the most robust and plethoric, or newly arrived European. Even the Duteh officers and Malays, who had been drawn from different parts of Java, and whom we had prisoners at Edam, fell victims as fast, or nearly so, as the English. Several officers, seamen, and soldiers, were sent on board from this island, in hopes that the change of air might mitigate the disease. Many of even the worst cases of these would promise fair for a few hours in the forenoon; but night always dispelled our hopes, for then the patient relapsed as bad as ever:—they almost all died. But their fate was considerably proerastinated by the change; many of them lingering out a great length of time on board, sinking at last from the consequences of the fever, rather than from the fever itself. Several of them changed into obstinate intermittents at sea, with great derangement of the liver, spleen, and bowels. Indeed the liver, in most cases, seemed affected from first to last in this fever; but in all protracted states of it, this affection became the prominent symptom. In those that were cut off during the first 18, 24, or 30 hours, the brain appeared to be the organ oppressed. With respect to the question, whether or not this fever was contagious? I am decidedly of opinion that it was not

so. For if all the nurses and medical attendants of the hospital at Edam died, it must be remembered, that they were equally exposed to the cause of fever, whatever it is, as the soldiers and seamen who did duty at the barracks and other buildings, or who were sent to the hospital for other complaints; all, or nearly all of whom, shared the same fate. Moreover, what I conceive decides the question, is this; that although on our raising the blockade of Batavia, great numbers of sick, in every stage of the fever, were brought on board from the hospital at Edam, yet not a single nurse, or medical attendant of any description, ever suffered the slightest attack of fever; nor did any circumstance transpire, that could in the least favour the idea of contagion, notwithstanding that the great accumulation of sick on both decks, rendered it a matter of impossibility to separate them completely from those who were well, nor at all times to prevent a considerable generation of effluvia.

From our first arrival at Batavia, in August, until our return to Malacca, in January following, we only buried one man of fever, who had *not slept on shore at Edam, Cuypers, or Onrust Islands*; whereas almost every person, who slept even a single night at Edam, died. No ill effects were experienced from going on shore in the day time, or among the sick at the island. I myself regularly visited the hospital of Edam every day, with perfect impunity, till one night that I staid rather late, attending the unfortunate Surgeon of the Dædalus; in con-

sequence of which I was three days afterwards seized with the fever, but recovered by mercury carried to ptyalism. I think it highly probable, however, that had I slept on shore, no medicine would have saved my life.

The night before we raised the blockade, parties of men and officers were sent on shore at Edam to blow up and destroy the works and buildings on the island, which operations detained them about half the night there. Most of these were shortly afterwards attacked with the fever, but all recovered except one (Mr. Parry, midshipman;) his fever, too, was checked by mercury; but being of a diseased habit, he relapsed when the soreness left his mouth, and died. The gunner, carpenter, and other officers, were all seized with the fever; but the former, being principally employed among fires, in laying trains, blowing up, &c. had the disease in an infinitely milder degree than any of the others.

One circumstance more is so singular in itself, and so much attracted our notice at the time, that I think it deserves commemoration. *Of all the people or patients who slept at the fatal island of Edam, four only, to the best of my knowledge, escaped the fever entirely, and returned to Malacca.* These were two obstinate venereals, and two chronic dysenteries; all under the influence of mercury, for some time before I sent them to the hospital. Their complaints did not get better in the least on shore, so that they continued to take mercury there. They slept in the same ward with the fever patients all the time, but never had the slightest symptom of fever themselves. One

other patient at the hospital did not catch the fever, but he was sent there in the last stage of phthisis, and died a few days after he landed

I have omitted to mention, that despondency, or anxious timidity, very frequently accompanied the access of this fever; while a placid resignation to their fate, or rather, an insensibility to their situation, marked its fatal close.

Treatment.

In this, as well as in the common fevers of India, where a redundancy of vitiated bile might be suspected lurking in the primæ viæ, I have always prescribed a solution of salts and emetic tartar, as the first medieine, which generally operated both upwards and downwards: and subsequently, by perspiration, in a short space of time, to the great relief of the patients. On the same evening, an anodyne antimonial draught (vin. ant. one drachm tinct. opii, gut. xv. vel xx, aq. menth two ounces) was exhibited, to allay the irritability of the stomach—promote the cuticular discharge, and dispose to sleep. Bleeding I was afraid to attempt, as in the *only case*, to my knowledge, where it was tried in this fever, the patient very soon afterwards died, in a state of putrescence. From this circumstance, and from some accounts which I had read, of its bad effects in fevers of the West Indies, I gave up all idea of the lancet.* I there-

* He probably alludes to Dr. Chisholm.

fore had recourse to evacuations from the bowels, and from the skin. For the latter purpose, I tried various medicines; such as the saline draughts, with sp. æther. nitros. tepid bathing, with diluents, &c.; but I found none equal to small doses of antimonial wine, and tincture of opium; given frequently, with plenty of warm, diluent drinks, and occasional pediluvium. By perseverance in this plan, for a few days, *in the less violent cases*, the skin has become relaxed, with an equally diffused perspiration—the pulse soft and natural;—the pains and delirium have disappeared; and nothing but debility remained, which was soon removed by bitters—bark, wine, and nourishment.

But alas! in the more concentrated forms of the disease, by which we were now surrounded, this practice was far from successful. *For here the patient hourly lost ground; and seemed to be hurried out of existence by the local effects of the fever; chiefly confined to the brain and liver.* *What the nature of these local effects was, I am unable to say.* They appeared to be either inflammation—an accumulation—or a greater determination of blood to those organs, or perhaps something compounded of all these; and evinced by the red, inflamed state of the eyes—the delirium—the oppression, tension, and often pain, in the epigastric and hypochondriac regions.*

* I need hardly remark, that these conclusions, the result of observations made at the bedside of fever, and in an extensive field, form a striking coincidence, and a corroboration of the theory of fever which I framed in the same school of experience.

Finding, then, that bleeding would be attended with fatal consequences, and that antiphlogistics and tonics were alike ineffectual, I was forced to have recourse to other means; and knowing that mercury was a powerful specific against local inflammation, particularly of the liver, as well as a most valuable medicine in bilious remittents, where visceral obstructions were forming, or formed, I placed my last hopes in the employment of this active remedy. I generally prescribed calomel combined with opium, and antimonial powder, in some few cases with camphor, in the following manner;

Calomel, six or eight grains,

Antimonial powder, two grains,

Opium, one grain.

These were made into a balsus, and taken every three, four, or six hours; so that from twenty-four to thirty-six grains of calomel might be taken in the course of the day and night. If a salivation could be excited in a few days, the patient experienced an immediate change. The fever entirely left him—the pains abated—the intellectual functions were restored—the stools became natural, and nothing but tonics, nourishing diet, and change of air were wanting to perfect the recovery. This last desideratum (change of air) the most important of all to convalescents, was least of all within our power, while we inhaled the noxious atmosphere of Batavia.

Here, then, we had the mortification to see our patients, after being rescued from the jaws of death—

every symptom of fever gone, and after being several days convalescent, with a relish for food—relapse one after the other, *as the soreness left their mouths*, and die almost to a man!

Many instances, however, occurred at Edam Hospital, where mercury was prescribed in large quantities, *after other medicines had failed in the beginning*, without affecting their mouths; in which case, they all proved fatal. I have sometimes prescribed bark and wine, in conjunction with mercury, to support the system during its exhibition, and I think that in several instances it accelerated the ptyalism.* Blisters often gave temporary relief to local symptoms, such as pain—hepatic affection, and vomiting. They likewise served as stimuli, to rouse the patient from stupor and delirium.

In the early stage of this fever, the tepid bath was used with advantage; but in advanced states of the disease, I think it did injury, by increasing debility. I have frequently experienced the greatest benefit from sponging the body with cold vinegar and water, where there was low delirium—cold, clammy sweats—and stupor. In such cases the pulse, from being 120 or 130, would fall to 90, and a refreshing sleep succeed;—but night always brought on the usual exacerbation. Gentle emetics of ipecacuanha, I have often found to relieve the delirium, oppressed breathing, and load at the stomach or præcordia, even at an advanced period of the disease. *In cases where great determination to*

* This is similar to Dr. Balfour's plan.

the brain appeared, I have often given brisk doses of calomel and jalap, with surprising good effect. Indeed, evacuating medicines of every kind, where they do not tend to debilitate the system, are extremely useful in the early stages of this fever. Wine, porter, and nourishment, did more harm than good, except in the advanced periods of the disease, when porter was always beneficial in checking the vomiting, and allaying the irritability of the stomach. Bark, in many cases, did much harm, by bringing on or increasing the vomiting, and other dangerous symptoms—besides checking the perspiration, and rendering the patients hot and restless. In some cases, however, I think it produced good effects, especially when guarded with opium, to make it sit on the stomach.

But could the patient be removed from the noxious air of Batavia into a purer atmosphere during the mercureial course, I should not have a doubt in the efficacy of mercury; for it was the only medicine that ever bade fair to check the ravages of this dreadful fever. Without this change of air, I believe that every human means will have but a temporary effect; and excepting mercury, few of them will have even that.

It is necessary to say, that copious ptyalism must be brought on, otherwise it will prove inefficient. I tried the nitrous acid, as recommended by Dr. Scott, of Bombay, but cannot say any thing in its favour. The Dutch medical practice at Batavia, consists in giving camphor in weak julep; making the patient drink quarts

of it in the course of the day, till the perspiration teems from every pore of his body; keeping him all this time in a close room, well covered over with warm bed-clothes, and without paying the least attention to any urgent symptom, or other means of arresting the fever. But this plan was very unsuccessful; for the mortality in the garrison of Batavia, while we lay before it, was dreadful, particularly among the European soldiers.

Previous to our appearance, the Dutch, in general, resided a few miles up the country, on elevated ground, and out of the reach of those pestilential vapours that issue from the low swamps in the vicinity of the city. There they enjoyed tolerable good health; but our arrival forced them into the garrison, where they had hard duty day and night, in keeping a look out upon us, and throwing up works to defend the place. The fever, therefore, swept them off in prodigious numbers, so that their loss far exceeded ours. In an action with some of their gun-boats, we had a few men wounded, who did well on board. But this seems to be a rare circumstance; for one of our officers being on shore with a flag of truce, was asked by the governor, how our wounds succeeded; and being informed that they were all nearly well, he seemed quite astonished, and would hardly give credit to the account; declaring, upon his honour, that during fifty years which he had passed at Batavia, he never knew a single instance of a man surviving a wound received in the noxious air of the city and its neigh-

bourhood.* He also expressed great surprise, that our mortality in the squadron was not greater; as he calculated on our losing at least half our men during our long stay there. The Dutch ships generally lost from half to three-fourths of their crews, between their arrival at *a tavia*, and their departure for Europe.

CASE I.—JAS. BARRETT, *Onrust Hospital.*

September 15th, 1800. Has been ill about forty-eight hours. At 5 P. M. to-day, a mad delirious fit; with difficulty can be kept in bed; tongue tremulous, white and furred; eyes red; complains frequently of his head, with pain in the epigastric region; skin hot, with some perspiration on it; has been taking bark three or four times to-day; head to be shaved and blistered; pediluvium; an æther and anodyne draught at bed time—the bark infusion to be given through the night.

16th. Had a very restless night; pain in the head excessive, and not relieved by the blister; calomel, gr. x. jalap one drachm, statim sumend; at 1 P. M. it operated, and brought off numerous, copious, foetid green stools. At six P. M. head not relieved; a profuse perspiration; pulse 90; tongue brown; talks incessantly in the most incoherent language; all the symptoms very unfavourable; the anodyne antimonial at bed-time.

* This corroborates the circumstance mentioned by Lind, of the slightest scratches turning into dreadful ulcers, on board the Panther and Medway, in 1761.

17th. He lay in a state of stupor all night; this morning, skin warm, and a little moist; decoction of bark every two hours, which he retains well on his stomach. At 1 P. M. lies in a state of stupor, and with difficulty can be roused; mutters between his teeth incessantly; eyes inflamed and prominent; abdomen tense and full; pulse frequent and hard; tongue dry; bowels opened by an enema; continue the bark; and to take calomel, gr. x. opii. gr. j. at bed-time.

18th. First part of the night more composed; restless in the latter; this morning, stupor as before; lies on his back, with mouth and eyes half open; with difficulty can be roused; body has an offensive smell; cold clammy sweats, skin changing yellow fast; pulse small and quick; when roused, will take whatever is offered; the decoction of bark through the day; repeat the calomel and opium at bed-time.

19th. Passed a tranquil night; repeated the calomel this morning; the decoction of bark to be continued; at 1 P. M. omitted the bark, and exhibited a saline cathartic, which brought off three copious fetid stools; at 8 P. M. he appears better; he is perfectly sensible; skin a bright yellow; but is warm, and has an equally diffuse moisture on it; repeat the calomel and opium as in the morning.

20th. Passed an easy night, but had no sleep; at 8 this morning, he seems better in every respect; continues sensible; repeat the calomel; also decoction of

bark; at 1 P. M. uneasiness in his stomach and bowels; fever increased; great incoherence in language and ideas; omitted the bark; prescribed a cathartic, which brought off many copious fetid stools; at eight in the evening, a remission of the fever; other symptoms more favourable; the calomel continued.

21st. Passed a good night, and is better this morning; repeated the calomel twice to-day, with bark decoction; at 8 P. M. an exacerbation of fever; repeat the calomel.

22nd. Passed a tolerable night; a mercurial odour on the breath; skin becomes less yellow, with equally diffused perspiration; the calomel and decoction as before.

23rd. Mouth sore, and all symptoms favourable; yellowness goes off the skin; perfectly sensible; no head-ache, stools more natural; craves for food; continue the calomel, with a pint of wine and nourishing diet.

27th. Ptyalism did not come on copious till to-day; he is now free from every complaint, except debility; appetite good—spirits free; yellow tinge almost gone; omit all medicine—convalescent list.

28th. He was this day sent, with other convalescents, &c. to Edam Hospital, where he afterwards caught the fever. He was removed immediately on board; the same plan of treatment adopted, and as soon as ptyalism appeared he began to mend. He

was one of the very few who ultimately recovered from the fever of Edam.*

CASE II.—W.M. WARD, Marine, *Onrust Hospital*.

September 18th, 1800. At 1, P. M. to day, complained of pain in his head, back, and loins; skin burning hot; tongue foul; pulse small and quick; pain at the stomach; nausea and retching; an emetic, which operated well; at night the anodyne antimonial draught.

19th. Passed a restless night; this morning complains much of his head; severe purging and griping; skin intensely hot; tongue foul and dry; the emetic-cathartic solution, which operated well both ways; at 8 P. M. the anodyne antimonial draught.

20th. Passed a very bad night; high fever this morning; dysenteric purging; skin burning hot and dry; tongue foul; pulse very quick; fixed pain about the umbilicus; tenesmus; calomel, grs. viij; pulv. ant. gr. ij; opii, gr. j; to be taken twice a day.

21st. All the symptoms worse to-day; skin clammy, with partial sweats; stools green, thin, small, and frequent; severe tenesmus; burning heat and pain at the stomach; omit the calomel; saline draughts with camphor through the day; anodyne antimonial at night.

* I leave it to the candour and judgment of the reader, whether the cure is to be attributed here to the bark decoction, or to the intestinal evacuations and mercury. This is a very valuable case—for it was a very formidable one: on the 18th it appeared nearly hopeless.

22nd. Passed a very restless night; severe purging of green, fœtid stuff; pain in the head and epigastric region excessive; skin intensely hot; pulse quick; thirst insatiable; great inquietude, never resting a minute in one position; had recourse again to the calomel, opium, and antimonial powder; but to be taken morning, noon, and night.—At eight P. M. a little more composed.

23rd. Passed a better night; this morning very restless and uneasy; all the symptoms as bad as yesterday morning, with the addition of frequent delirium, and pain in the right side.—The same treatment as yesterday.

24th. Slept some last night; symptoms this morning rather more favourable; the internal burning heat in the epigastric region not so great; the extremities covered with cold, clammy sweats; the calomel bolus repeated three times, as usual, with camphor mixture every four hours.

25th. The dysenteric symptoms not so violent today; heat and pain in the epigastrium diminished; the pain of the right side subsiding; at noon, a violent paroxysm of fever, ushered in with rigors, which has left him in a very debilitated state; added decoction of bark and port wine to the mercurial treatment.

26th. Mouth sore; fever gone; bowels easy; asks for food; medicines continued as yesterday.

27th. Ptyalism; recovering fast; omit the mercury, and to have nourishing diet.

28th. Ptyalism continues; free from all complaint; returned on board of his ship.*

CASE III.—Jos. HUGHES, Marine, *off Edam.*

October 9th, 1800. Complained this morning of the usual symptoms of the Batavian fever; his head-ache exceedingly intense. He had done duty on Onrust Island, where he slept, and often got intoxicated with arrac; an emetic, and after its operation, the anodyne antimonial draught.

10th. A very restless night; great pain in the forehead this morning; internal heat and pain at the pit of the stomach; tongue foul; bowels uneasy; pulse full and quick; frequent small, green, foetid stools; ordered the

* This is also a very valuable case. It shews us the fever accompanied with dysenteric symptoms—and where the determination to the liver was quite evident.

If these honest and plain narratives do not remove every shadow of doubt, in regard to the power of mercury in tropical fevers of the East, all human testimony is vain. These documents are more convincing than if they came from myself—for I might either be blinded by prejudice, or have some interest in distorting the truth. Neither of these can have operated here—for the practitioner evidently resorted to mercury with reluctance, and hardly ever, till other means were first tried. Lastly, I cannot deviate in the least from the letter of the original; for the gentleman who noted these cases is now in England (though perfectly unconscious of their coming before the public) and could instantly detect any misrepresentation.

emetico-cathartic solution, which operated well both ways; the anodyne antimonial as last night.

11th. At one o'clock this morning, he was seized with convulsive twitchings; difficult breathing; alternate flushes and rigors; rattling in his throat; insensibility; pulse small, quick, and irregular; sp. c. c. gt. xxx. aq. menthae one ounce and a half, æther. vitriol. half a dram; this paroxysm lasted three hours with momentary intermissions; at eight this morning, more composed; skin hot and dry; tongue foul and furred; abdomen full and tense; natron. vitr. one ounce; two copious fetid stools; evening, something better; perspires; the night draught as before.

12th. Slept till midnight; at one o'clock, stole out of bed, and leaped overboard; but was instantly picked up by a boat, that happened to be alongside. He was now perfectly sensible, and somewhat frightened; could not account for his conduct; returned to bed; at nine this morning, tongue foul; skin warm and clammy; body has a disagreeable smell; camphor julep every two hours; at 1 P. M. became very restless; made several attempts to get overboard; (to walk in the garden, as he expresses it); talks incoherently; at 4 P. M. worse; cold, profuse, clammy sweats; complains of no pain; when asked how he does; replies, "Very well;" pulse small and fluttering; lies on his back, in a state of stupor; mouth and eyes half open; can hardly be roused; the camphor julep continued, with an opiate at night. He drank a pint of Madeira wine in the course of the day.

13th. No sleep last night; cold, clammy sweats to-day; made several attempts to get overboard; pulse small and quick; tongue covered with a brown crust; still answers that he is "very well" (a dangerous symptom); decoction of bark and port wine; his stomach retentive; opium and camphor at bed-time.

14th. Very restless in the latter part of the night; delirious; made several attempts to get overboard. This morning, violent black vomiting, which was checked at 1 P. M. by opium, æther, and a blister to the epigastrium; great restlessness; constant desire to get overboard; skin cold and clammy; brain and mental functions still much disordered; craves for wine, which is given to him; at 4 P. M. more collected; begs to be sent to the hospital; his request complied with. At 5 P. M. he got up, in good spirits; dressed himself; went into the boat, unassisted; when landed, he insisted on carrying his own hammock and bed up to the hospital, which he actually did—he there drank a glass of port wine, and went to bed : at eight in the evening he was in a sound sleep, with a fine warm moisture diffused over his skin, and every symptom favourable: at five in the morning, he was found dead in his bed; lying on his face, with nearly a gallon of red and yellow stuff, resembling blood and bile, under him, and which was still running from his mouth. On shifting him, to have him buried, his whole body emitted the most intolerable effluvia. He must have died suddenly, and without a groan: as three nurses sat up in the ward and thought him asleep all night.*

* This is a singular, though, I think, not inexplicable case.

CASE IV. ROBT. ALDRIDGE, Marine, *H. M. S. Centurion.* *Off Edam.*

13th October, 1800. Was seized last night with fever, ushered in by cold rigors. At eight this morning, skin clammy; head giddy; pulse small and quick; tongue

It furnishes at least one important reflection—namely, how easily may we be deceived by the phantom *debility*. Forty-eight hours *before* this man carried his hammock to the hospital,—“he lay on his back, his eyes and mouth half open—his pulse small and fluttering.” Was not the debility here apparent, not real? Were not his powers oppressed—not exhausted? Else how could two short days of subsequent fever and delirium give him the almost miraculous strength—“to rise, take up his bed, and walk?” It is quite inconsistent with observation, that this could have been one of those fatal calms preceding death, from mortification of an important organ. In such cases, although the patient fancies himself relieved, or even that he is strong, there is little real force. The sound sleep, and warm moisture on the skin, are very incompatible with actual mortification. But if we advert to the state of the brain for several preceding days, we shall not hesitate to say, that effusion or rupture of vessels carried him off instantaneously.

The morning before, we see that he was seized with violent black vomiting, which was checked by medicine. The return of this, when he was in bed, after the preceding exertion, and a great determination for some time past to the brain, has caused sudden rupture or effusion, which induced immediate death, or apoplexy ending in the same. Finally, was it not this *apparent debility* which prevented the exhibition of cathartics and mercury, so successfully employed in the preceding case?

white and furred; bowels uneasy, with pain about the umbilicus; a saline cathartic, camphor julcp every two hours.

14th. Passed a tranquil night. At eight this morning, skin hot; severe pain in his head; stomach uneasy; an emetic of ipecacuan, which brought off much green bile; an anodyne antimonial at bed-time.

15th. At ten o'clock last night, a great exacerbation of fever, with delirium, which remitted at four this morning. At 8. A. M. complains of debility and headache; skin soft and perspirable; bark decoction every two hours; at noon became delirious; skin hot and dry; at 6 P. M. high fever; head much affected; great incoherence; pulse full; tongue foul; bowels costive; omit the bark; a saline purgative procured three stools; the draught at bed-time, as before.

16th. Passed a restless night. At eight this morning, high fever; severe pain in the head and stomach; internal burning heat in the epigastrium; calomel gr. viij; pulv. ant. gr. ij; opii, gr. j; fl. bolus, ter in die.*—

* Too late. An active employment of mercury from the beginning, without any other aid than venesection and copious intestinal evacuations, would have had the patient now on the verge of ptyalism.

Let those who are disposed to cavil at some points of practice pursued here, particularly the exhibition of bark, and omission of venesection, point out from what sources the surgeon could have drawn a better *methodus medendi*.

At 2 P. M. skin moist and warm; pain in the head and stomach; 6, P. M. became very hot and restless; pain in the region of the stomach severe, with intense burning heat there, both internal and external; calomel, &c. continued.

17th. Was easy all night—passed two copious stools; skin was warm, with equally diffused moisture; at eight this morning, he is better; the pain has left his head and stomach; at 1 P. M. uneasiness in the region of the liver; *cannot bear the least pressure over it*; the calomel continued ter in die as usual; at 3 P. M. stomach uneasy; black vomit (resembling coffee grounds exactly;) severe pain in the forehead; the effervescent draughts every two hours; added four grains of camphor to the evening dose of calomel.

18th. Restless night; *delirium*; *watery eyes*; skin changing yellow. This morning, complains of twitch-

Certainly not from books; at least, not from the works of Bontius, Lind, Clarke, or Balfour. Nay, at this day, venesection is condemned and bark extolled! Dr. Bancroft, one of the latest writers on Yellow Fever, seems to rely principally on bark. Mr. Curtis, the last writer on the Diseases of India, boasts of having seldom “wet a lancet, except in specific inflammation.”

If it be said, why did not *observation* point out the necessity of bleeding, and the injury occasioned by emetics and bark? I answer, by asking,—Why did not *observation* point these out long ago to those writers enumerated? Why did not Cullen find out the utility of purgatives in fever before Hamilton?

ings in the calves of his legs; collected and sensible when spoken to; calomel and camphor as before; blisters to his legs; at noon, skin cold and clammy; profuse perspirations; tried the bark in various forms; but the very sight of it made him vomit; the calomel and camphor continued ter in die; at ten P. M. sensible to the pain of the blisters.

19th. Slept a little last night; this morning, giddiness; skin of a bright yellow colour; took the bark with much persuasion; at 11 A. M. it made him sick, hot and restless; bowels uneasy; abdomen tense and full; glysters brought away several foetid stools, and stuff like grounds of coffee; took xxxiii grains of calomel to-day, but no appearance of its entering the system; skin of a deep yellow colour.

20th. Restless and delirious in the night; oozing of blood from nose and mouth, which tinged the linen yellow.* This morning, skin hot and dry; tongue brown; intolerance of light; head much affected; starts when spoken loudly to; says he is "very well," and seems much surprised at being asked the question; lies on his back, with mouth and eyes half open; pulse small and stringy; took xxxii grains of calomel to day, with camphor julep.

21st. Symptoms as yesterday. In this state he continued for forty-eight hours, when the black vomit, with convulsions, carried him off, on the 23d October, the

* If this be not a case of "*Yellow Fever*," I know not what is.

10th day of his illness. Not the least symptom of ptyalism could be seen, though he took calomel to the last hour.—He had done duty on shore, both at Cuypers and Ourust, where he lived very intemperately.*

CASE V. Mr. THOS. F. CARTER, *from Edam.*

October 26th, 1800. Has been six days ill with the Batavian fever on Edam Island, and sent on board at six o'clock this evening, in hopes that change of air may mitigate the disease.

He now complains of coldness in the lower extremities; bad taste in his mouth; a troublesome purging; great dejection of spirits; pain in the head and epigastric region; pulse small and quick; frequently delirious before he came on board; had taken bark in various forms at the hospital, without any benefit; on the contrary, he daily got worse. The emetic-cathartic solution was given him this morning on shore, which is still operating; as he was much fatigued by coming on board, gave him a glass of port wine, and the camphor julep.

27th. He was delirious and sleepless all night; skin hot and dry; the solution continued to operate in the night both ways, and he passed several fetid stools. At nine this morning, all the symptoms worse; talks in the most ineherent language; tongue very foul; pulse full and quick; complains of great pain over the orbits and sinciput; pain and burning internal heat at the

* Was there not effusion in the brain here, as well as derangement in the liver?

stomach; calomel, gr. viij; camphor, gr. iv; opii, gr. j; ter in die;* a blister inter scapulas.

28th. First part of the night restless; latter part quiet, and slept a few hours. At nine this morning, all the symptoms aggravated; delirium; *full, quick pulse*: pain over the orbits, and in the sinciput; right eye much inflamed; blister rose well; is sensible to the pain of it; same treatment as yesterday.

29th. Delirious all last night; talks incessantly this morning, in very incoherent language; says he feels as if he had two heads; his eyes cannot bear exposure to the light;† has frequent convulsive twitchings of the tendons; repeated the calomel this morning; he drank a little brandy and water, which he relished much; at 8 P. M. very restless; skin hot and dry; tongue foul; twitchings of the tendons; right eye much inflamed, and prominent; had one fetid, biliary stool; when asked how he does, replies, "Very well;" and that nothing is the matter with him; his mind constantly employed about the ship's duty and prize stores; his countenance singularly wild and sallow: omit the calomel; pediluvium; diaphoretic powders of camphor and nitre; diluents.

* This is the seventh day of the disease—greatly too late?

† There are evident symptoms of congestion, if not inflammation in the brain. This oppressed state of the sensorium renders the absorbent system so torpid, that there is no chance of the mercury being taken into the constitution. Evacuations, under these circumstances, by relieving the brain, invariably accelerate ptyalism.

30th. Very restless all last night; with great difficulty could be kept in bed, preferring the cold deck; was highly delirious; right eye prominent, and much inflamed; complains of pain in the calves of his legs; blisters to his legs; gave him a brisk dose of calomel and jalap, which operated and brought off two copious fetid stools; at noon, he is much more composed;* complains of strangury from the blister. Semicupium and sp. æther. nitros. gave relief to this symptom; great deafness; clammy, profuse sweats; small, weak pulse; bark and claret; the calomel to be again renewed. At 6 P. M. his right eye still inflamed, red and prominent; pulse full; violent delirium subsided; *half an ounce of bark, and a pint of claret, since morning*, which his stomach retains.†

* Although evacuations always gave more or less relief in this fever, yet the idea of debility that unlucky term—seems ever to have cramped their employment.

† “The prejudices that formerly existed against the Peruvian bark, in fevers,” says Dr. Hunter, “are no longer in being.” “They were founded in *idle speculations*, and “originated with the learned, from whom they descended “to the great body of the people; but even with the *vulgar* “they are now extinct.” *Diseases of Jamaica*, page 122. At page 98, we have this remark: “In almost every case where the disease is *violent*, and the patient much reduced, it (wine) is highly grateful and cordial. It is of the utmost consequence, in giving both nourishment and wine, that they be repeated often.”

Dr. H. recommends about a pint a day, in small quantities at a time, and the same of food. Who can blame the

31st. Very restless all night, with *raging high delirium*; great difficulty in confining him to his bed; tongue and lips brown and crusted; stomach tense, with burning internal heat in the epigastrium; right eye red and prominent; at one o'clock this morning, a blister renewed to the back of his head; the calomel and jalap repeated; at six this morning no better; right eye inflamed, prominent, and seems *starting out of his head*, with other symptoms of a highly deranged state of the brain; *neither the blister nor purgative has taken any effect*;^{*} two large yellow blotches have appeared on his neck; I am forced to keep him lashed down in his bed, as he made several attempts to get overboard; tore the blisters from his head; constantly grasping at every object; great deafness; no recollection of any person; his mind still employed about his accounts, and the ship's duty; strong convulsive spasms of the whole body; so that it often requires two men with all their strength to keep him down;[†] the *raging high delirium* sunk hourly, till a few hours before death, when we could hardly

surgeon for pursuing a plan recommended by such authority? And as I observed before, where has he any better instructions in fevers of the East?

* The torpor alluded to is here manifest—and there can be little doubt of its dependence on oppressed sensorium.

† With the strength of two men the day before death—his body unreduced—and where mad delirium, and eyes starting from their sockets, declared the state of the brain, I should have been tempted to bleed *usque ad deliquium*, or the relief of the symptoms, *coute qui coute*.

hear him articulate, he was carried off with hiccup and convulsions next night, his body very little reduced, and without the least disagreeable smell.

Previously to the attack of fever, he was constantly employed on shore at the island of Edam, where he had charge of the prize-stores, and where he frequently exposed himself to the intense heat of the sun by day, and the noxious influence of the air by night; he used to sleep at the hospital; he died on the 11th day of his illness, six days after he came on board.

CASE VI. Mr. HAMMOND, Captain's Clerk. *Off Edam.*

October 23rd, 1800. Was in the habit of being much on shore at Edam Island during the day; but never passed a whole night there; seized last evening with the usual symptoms of the Batavian fever; head much affected; great pain over the orbits; took the emetic-cathartic solution, which operated well; at night the anodyne antimonial.

24th. Passed a restless night; his bowels very uneasy; this morning he is very ill; all the symptoms violent; small, hot, bilious stools; the solution as yesterday, which operated both ways; at night the draught repeated.

25th. Passed a very bad night, with violent pain in the head and epigastric region; hot, dry skin; quick pulse; great inquietude of the system at large; could not rest a moment in one position; foul tongue. This morning, all the symptoms the same as during the night; ca-

lomel, gr. viij; pulv. ant. gr. ij; opii. gr. j; three times a day.* At 8 P.M. he appears a little more composed.

26th. Had a violent paroxysm of fever in the night, ushered in with cold rigors. This morning, he is very poorly indeed; distressing bilious purging; countenance sallow and anxious; all symptoms appear exceedingly unfavourable; continue the same treatment.

27th. Passed a bad night; no alteration for the better; head-ache intense; pain in the epigastric region; hot, dry skin; pulse quick; dysenteric purging; medicine continued.

28th. No alteration; had a violent exacerbation of fever to-day, ushered in, as before, with rigors; continued the same treatment; no appearance of ptyalism.

29th. Mouth sore. All the symptoms alleviated; head-ache, and pain in the epigastric region, diminished; bowels easier; calomel bolus twice a day only.

30th. Mouth sorer; all the bad symptoms disappearing; complains only of debility; decoction of bark and wine.

31st. Mouth very sore; spits copiously; keen appetite; omit the calomel; put him on the convalescent list, with wine, and nourishing diet; from this time he recovered rapidly. This case was treated entirely with mercury.†

* This is the fourth day of the disease, counting the evening of the 22nd as one.

† It would be difficult to conceive how a more unequivocal proof of the efficacy of any medicine could be given.

CASE VII. Mr. POWEL, Master's-mate. *At Edam.*

November 30th, 1800. Was attacked with fever yesterday, on shore, at the island of Edam, where he has resided, in charge of the prize-stores, since the death of Mr. Carter. This morning, complains of the usual symptoms; pain and giddiness of the head; hot skin; cold extremities; quick pulse; the emetic-cathartic solution; after the operation of which, the anodyne antimonial.

14th. Restless night; was much purged; cold sweats, burning, acrid heat at the pyloris; pain over the orbits; 6 grains of calomel, and one of opium, thrice a day; also the camphor julep every three hours; port wine or porter, as much as he can take; cold ablution; at 6 P. M. symptoms nearly the same; had many foetid, bilious stools, during the day; spirits generally dejected; cold sweats on the extremities; pulse small, quick, and fluttering; tongue brown and crusted; great apprehension of death; bark.

15th. No rest all night. This morning, all the symptoms worse. At 10 A. M. the fatal black vomit has appeared; cold sweats; delirium; omit the bark, which will not lie on his stomach: repeat the calomel; æther and laudanum draughts every two hours; evening, the vomiting checked a little; blisters to the head

than is afforded in this case. I had set it down as lost, till I saw the words "*sore mouth,*" on the 29th, which dispelled my fears; for well do I know, from personal feeling, what *ease* this *soreness* brings.

and stomach; skin begins to change yellow; breath becomes foetid; every symptom unfavourable.

16th. No sleep last night; worse in every respect this morning; he sinks hourly; low delirium; muttering; lips and teeth encrusted black; breath foetid; insensible; lies on his back, mouth and eyes half open; skin intensely yellow; pulse small and fluttering; same treatment.

17th. Black vomit all night; cold sweats this morning; tongue black; pulse fluttering; singultus; eyes glassy; breath very foetid; stools involuntary, and black, like coffee grounds; lies on his back, eyes and mouth half open; carried off, in an attempt to vomit.*

WADE SHIELDS.

The foregoing cases, selected out of an immense number; will be sufficient to convey a very accurate idea of this endemic, and to support the remarks and general description which preceded them. I have exhibited more fatal than favourable terminations; as the former must include the whole range of symptoms, from health to death, and ascertain the inefficacy of measures in which we might be apt to place too much confidence.

It certainly will not be denied, that this is a very interesting and valuable document, as it gives us a much

* Will any one assert, after reading this, and many other cases here, that the "*Yellow Fever*," never appears in the East?

clearer view of the Batavian fever, than any English work in circulation; accompanied with numerous collateral incidents and observations that excite reflection, while they strongly rivet our attention.

I shall glance hastily at some prominent traits in the character of this fever, with a few remarks on its cause, leaving the reader to form his own conclusions.

In the first place, the great similitude which it bears, in most of its leading features, to the endemic of the West, cannot have passed unnoticed. Independently of the yellow skin and black vomit, they coincide in many minor, but characteristic symptoms; for instance, the mental despondency, amounting to timidity, at the beginning, veering round to non-chalance or apathy, in the progress of the disease.

That fatal lull, and occasional sensation of hunger too, which are so apt to deceive the inexperienced in the Western endemic, frequently appeared in that of the East. Neither would it seem very difficult to account for their discrepancies. For whether we allow that these endemics are solely caused by the local miasmata, or are the bilious remittents of hot climates, resulting from atmospherical influence, but aggravated by these invisible agents; still, in either case, as the cause, or combination of causes, must vary according to the nature of the climate and soil, so we cannot expect to have their effects agreeing in every minute particular. Nevertheless, as the operation of these causes on the human frame appears to be nearly the same in

all climates, we can clearly discern (in the broad outline of their effects) a strong family likeness through the whole ghastly tribe.

“—————facies non omnibus una
Nec diversa tamen, qualis decet esse sororum.”

The opinion that these grand endemics (yellow fever, for instance) are only the bilious remittents of all tropical climates in a more concentrated state or degree, is founded, I fear, on too great a rage for generalising. The bilious remittent may take place an hundred leagues at sea, in consequence of atmospherical vicissitudes acting on particular organs, whose functions were previously disturbed by atmospherical heat. The endemic, on the other hand, is produced by a specific miasm, (witness that of the fatal island Edam) which, independently of all those peculiar states of the air, or the body, requisite for the production of bilious remittent, will, when in a condensed form, kindle up, at any season, and in any constitution, a fever of terrible malignity.

These diseases then, may be often—perhaps generally combined; since their causes acquire force and subside, *pari passu*, and at the same period of the year. But assuredly they are sometimes totally distinct, and quite unconnected with each other.

This reasoning is corroborated by the fact, that time, (for instance, eighteen months or two years in the West Indies) will accustom the human frame to the action of

the febrifc miasm, and thereby secure it, generally speaking, from the endemic; but no number of years is a protection from the bilious remittent.

The circumstance of the Dutch officers and Malays falling victims at Edam, might seem to militate against this doctrine; but the objection vanishes, when we recollect, that by previously residing in the country, entirely out of the sphere of the local effluvium, they were in reality no more seasoned to it than the English; and the mortality in the garrison proved it. They were in the same situation as the native or veteran West-Indian, who, by spending a few years in Europe, or the interior of the country, loses his protection against a visitation of yellow fever on his return to the sickly towns.*

Neither will residence in one tropical climate prove a security against the local endemic of another, as the above circumstances themselves render evident. Thus

* Dr. Fergusson in mentioning the fatal yellow fevers which ravaged the West India Islands in 1815, states—"In all it has been confined, for the most part, to the towns, and except at Bridge-town, to unseasoned Europeans. There it extended to unseasoned sojourners—even to *Creoles from the interior of the country*, who, in the time of the insurrection, were obliged to resort to the town on military duty." *Med-Chir. Trans.* Vol. viii. p. 144. Again, Mr. Dickenson, Surgeon, to the Forces, states in the 48th Number of the *Medical Repository*, that—"Dreadful were the numbers the writer saw under the mortal grasp of marsh fever at Prince Rupert's Dominico. *They were subjects assimilated to the climate, although strangers to that particular station.*"

the crew of a ship, that has been two or three years on the coast of Guinea, and sails direct from Sierra Leone to Barbadoes, which are nearly in the same parallel of latitude, will be as liable to yellow fever, as if they had sailed from England; while a two years' station in the West Indies would have almost insured a subsequent exemption.

Indeed, the plan of seasoning troops against *yellow fever*, by stationing them for some time previously, at Gibraltar, Madeira, or in the Mediterranean, has completely failed; and how could it be otherwise, if the coast of Guinea itself is no protection? a melancholy proof of which was exhibited in H. M. S. Arab, in 1807; which ship came from the latter place (where she had been nearly two years) to the West Indies, and suffered dreadfully by the yellow fever.*

These facts (particularly the last) must go far to dissolve the theory of the ingenious Dr. Bancroft, who has laboured to prove, that "the security from the disease (yellow fever) is principally derived from the ability to endure great heat." *Essay on Yellow Fever*, page 265. The dangerous consequences which might obviously

* "It is certain that if having had the West India yellow fever secures an exemption from the Gibraltar one, this last gives no security in kind. Captain Johnson of the Queen's regiment now here, had the Gibraltar fever in 1804, and he has just now recovered with difficulty from a very alarming attack of the prevailing Epidemic." *Fergusson on yellow fever, Med. Chir. Trans. vol. viii. p. 124.*

result from trusting to such a protection, as well as Dr. B.'s candour and humanity, will induce him to re-consider the subject. The officers and crew of the Arab, on their arrival in Carlisle Bay, considered themselves perfectly seasoned and secure; but on putting to sea, in the course of a month, the endemic broke out with such violence, that in one week they lost thirty-four men, and were forced to put into Antigua, in the greatest distress.

Dr. Bancroft, indeed, is not singular in his opinion, which appears to be copied from Dr. Trotter [Medicina Nautica, vol. 1, page 336] who has *theorised* widely on a foundation which the foregoing *facts* completely overturn. Dr. T. probably took the doctrine from Dr. Moseley, who tells us that a seasoning at *Bermudas* will secure us from the yellow fever of the *West Indies*, p. 65. Let no such plan be trusted.

The locality and range of this febrifc miasma, are clearly decided by the Dædalus. Her ship's company breathed the same general atmosphere as the other crews, for months together; but, with the exception of the purser and surgeon, no man belonging to her came within the fatal circle (in the night, at least) though seldom more than two or three miles from its centre. The officers abovementioned exclusively felt its influence, and like too many others, fell victims to its direful force. It is probable, however, that where a trade wind or monsoon sets over a large tract fraught with febrifc miasmata, these invisible agents may be carried

to a much greater extent than where calms or gentle sea and land breezes prevail. This is exemplified in the fever of Coimbatore, [Sec. 3.] and ought ever to be borne in mind by navigators in anchoring ships in the vicinity of swamps, or generals in pitching tents or stationing troops. The direction and prevalence of winds are ever to be coupled with the medical topography of a place.

This document furnishes decisive evidence on two points of great practical importance. One is, that even within the limited range of this poison, its power is nearly inert, comparatively speaking, during the day; the other, that when nocturnal exposure has given rise to the disease, it is non-contagious. It is obvious what an influence the certain knowledge of these circumstances must have on our conduct, and to what useful purposes we may apply it.

In this, as in all other violent endemics, the head and epigastric region were, as usual, the foci of the disease. The inutility, or rather the injury of every other medicine, than mercury and purgatives, was abundantly manifested. But with all due deference and respect for the surgeon, and a proper allowance for the embarrassing situation in which he was placed, I conceive that the first remedy was not applied early enough, or with sufficient boldness; and that the purgatives, through a false fear of debility, were not so frequently administered, as their evident utility warranted.

In the solitary instance, where venesection had a

trial, the hasty conclusion which was thence formed of its pernicious effects; in consequence of the sudden death and putrescence of the patient, deserves a remark. If the reader will revert to Joseph Hughes, (Case III.) who, after dressing himself in good spirits—going into the boat without assistance—carrying his hammock up to the hospital—retiring to bed, and falling into a sound sleep, was nevertheless found dead in the morning, “his body emitting the most intolerable effluvia;” he will probably agree with me, that had this man been bled on entering the hospital, his death might have been attributed to venesection, with as much *apparent* justice, as any *single* incident could support.

This may serve as a lesson to us, how wary we should be in rejecting entirely a powerful remedy, from solitary or even several failures. For how difficult is it, in such cases, to say with certainty—such is the successful, and such the unsuccessful medicine! The prejudice against bleeding (seemingly justified by this event) was engendered too, by “accounts which had been read of its bad effects in fevers of the West Indies;”—fevers in which its pre-eminent service is now ascertained beyond the shadow of doubt.*

* What will the reader think of the following passage in a modern publication?—“In such cases as seemed most to require it; (blood-letting) for example, where the patient was young, strong, of a full habit, and lately arrived from Europe; where the pulse was quick and full, the face flushed, with great heat and head-ache; and all these at the beginning of the fever, *bleeding did no good.*”—*Hunter on the Diseases of Jamaica, 3d edition, page 118.*

From all these considerations, and from an attentive examination of the symptoms themselves, we may conclude, that venesection deserves a much further and fairer trial in this fever; and I entertain little doubt, that it will be found a powerful auxiliary to the other means of cure.

Of the efficacy of mercury, under all its disadvantages, I need say little. There is the decision of the surgeon himself, who treated nearly 200 cases of the fever—there are specimens of these cases detailed—and there is a strong proof of the dependance placed on this remedy, where we find the surgeon himself confide his own life to its power, when attacked by the fatal fever of Edam. I would, however, recommend it to be used in the early and liberal manner pointed out in the Bengal endemic, with the same attention to venesection and intestinal evacuations. The ptyalism should be copious, and more or less of it kept up till strength be completely restored. The cold affusion bids fair, during the reaction; and, at all events, cold applications to the head, with warm pediluvia, will invariably prove serviceable.

The opinion of Dr. Cullen, that the influence of the remote cause ceases when the fever is once formed, is here proved to be not only erroneous, but dangerous. Removal from the sphere of its action, during fever, invariably protracted the fatal catastrophe; and could the patients have been transported quickly into a pure air, while ptyalism went on, they would in all human pro-

bability, have survived, as the surgeon himself believed.

One remarkable incident remains to be noticed, and cannot have eluded the observation of the reader. I mean the circumstance of the four *mercurial* patients, who resisted the baleful influence of Edam. Such an immunity cannot be attributed to chance. The proofs are both positive and negative. *They, and they only, escaped the fever.* It accords with my own experience; for I have not known a person fairly under the influence of mercury, for the cure of any other complaint, to be attacked either by endemic or contagious fever. I have seen several, who were reduced by long courses of mercury previously, and who had left it off, fall victims to fever and flux; but not during the exhibition of the medicine. We know that a slight, or even a free ptyalism, may be kept up for weeks together, without any serious injury to health; and if such a state proved an antidote (as it did here) against the most powerful cause of fever that ever, perhaps, had "a local habitation, or a name," the inconvenience of the prophylactic is very trifling, compared with the security it may afford. The rationale of the preservative is not very unreasonable. If it cure the disease, it *may* also have some power in preventing it. Bark was formerly considered capable of both—(witness the peruvian drams that used to be served out to wood-cutters in hot climates); fatal experience has proved it equal to neither! Mercury, by keeping up the action of the extreme vessels on the surface, and in the hepatic system, prevents, what I

conceive to be the paramount effects resulting from the application of febrifig miasmata—*inequilibrium in the balance of the circulation and excitability, and congestion or inflammation in one or more of the internal organs.*

It is proper to observe, however, that many medical men of talents and observation, deny that mercury is possessed of any prophylactic power. I only state what has come to my own knowledge on the subject.

DISORDERS OF THE HEPATIC SYSTEM.

SEC. IX.—“The exclusive efficacy of mercury,” says Dr. Saunders, “in liver diseases of the continent of India, may perhaps be explained, by supposing they arise from an *indigenous and local poison, or miasma*, peculiar to that country, unlike any thing known in any other part of the world, even under similar latitudes and temperatures.”

Had this ingenious and deservedly eminent Physician ever visited the continent alluded to, his penetration would have discovered the cause of this phenomenon, without the aid of an “indigenous poison,” which, like the introduction of an epic divinity, is a more poetical than philosophical mode of extricating ourselves from difficulties, and *loosing the gordian knot.**

* See the Section on Egypt in a subsequent part of this Work, where Hepatitis is proved to be equally as prevalent

In order to clear the way for this investigation, it is necessary to inquire, whether this “endemic of India” be equally prevalent in all parts of that vast empire. Here universal evidence gives the negative; and every one, in the least acquainted with the medical topography of the country, knows, that genuine, or idiopathic hepatitis, is ten times more prevalent on the coast of Coromandel than on the plains of Bengal; while, on the other hand, intermitting and remitting fevers are ten times more numerous in the latter than in the former situation. Let us next see, if there be any particular difference in the climates and temperatures of these two places. By exact thermometrical observations made at Calcutta, by Mr. Trail, during a whole year, the following appears to be the monthly medium heat of three different diurnal periods—morning, noon, and evening.

TABLE.—No. I.*

January	66°	May.....	84°	September...	82½°
February...	74	June	83	October	82½
March.....	79	July.....	83	November ...	76
April.....	86	August.....	82	December ...	68

Annual Average, 78½ Fahrenheit, 1785.

Let us compare this with the heat at the presidency on the coast.—The following is copied from the Ma-

on the banks of the Nile as on the Coast of Coromandel. Hepatitis is very prevalent also on the Coast of Africa, where the heat is excessive.

* Vide 2d vol. Asiatic Researches.

dras Gazette, shewing the state of the thermometer at the Male Asylum, during one week in July 1804, which was by no means remarkable for any extraordinary range of temperature.—

TABLE—No. II.

<i>State of the Thermometer at the Male Asylum, Madras.</i>						
1804.	7 A.M.	Noon.	3 P.M.	8 P.M.	Average.	Remarks.
July 11 ...	81	88	89	85	86	
12 ...	81	88	90	86	86½	
13 ...	81	91	92	86	87½	
14 ...	82	90	93	84	87¼	"The thermometer is placed in a room moderately exposed to the weather, and facing the North West."
15 ...	83	91	94	88	89	
16 ...	84	92	95	91	90½	
17 ...	85	94	96	91	91½	

Total Average, 88½.

Now it is well known, that, excepting for a few weeks at the change of the monsoon, in October and November, the Coromandel coast is remarkable for a cloudless sky and steady temperature, all the year round; the heat, however, being often above the specimen exhibited as the following table from Dr. Clark will shew.

TABLE.—No. III.

State of the Thermometer on board the TALBOT Indian-man, in Madras Roads, from the 24th July to the 23d August, 1771.

Month.	Day.	Hour.	Ther.	Month.	Day.	Hour.	Ther.
July ..	24	12	90	August.	8	7	96
		6	96		9	12	89
	25	12	88			4	87
	26	12	90		10	12	93
		3	93			4	88
	27	12	90		11	2	94
		3	93			4	89
	28	12	90		12	12	93
		3	92			4	90
	29	12	93		13	12	90
		4	96			4	87
August.	30	12	90		14	12	89
		4	94		15	12	89
	31	12	91			3	90
		4	93		16	12	90
	1	12	93			4	94
		4	94		17	12	94
	2	12	92		18	12	93
	3	12	90		19	12	90
		3	91			4	87
	4	12	90		20	8	90
		4	92			3	94
	5	12	92		21	8	92
		4	94			3	95
	6	12	89		22	11	94
	7	12	90			4	87
		5	92		23	10	86
	8	12	93			3	88

Total Average, 91°.

Dr. Clark remarks that, "on account of the sandy soil of Madras, it was found moderate enough to allow a thermometer to rise six or seven degrees higher ashore." This would make the average, for a month in succession, 97 or 98°.—*Vide Clark on Long Voyages, page 56 et seq.* Mr. Curtis, speaking of the Coromandel coast, where he remained on shore more than a year; observes—" Except for two or three weeks about the shifting of the monsoons, especially that which happens in the month of October, a shower of rain, or a breeze, are (is) almost unknown; scarce ever a haze or cloud appears upon the horizon to mitigate the dazzling ardour of an almost vertical sun; and the thermometer, through the whole twenty-four hours, seldom or never points under 80° of Fahrenheit, but generally far above it." Introd. p. xvii. How far above 80 it generally points, the preceding tables will clearly evince.

The nature of the soil is such, that while the sun is above the horizon, it acquires a much superior degree of temperature to that which the plains of Bengal attain; in consequence of which, the nights are often hotter than the days, when the land-winds prevail in May, June, and July. I have seen the thermometer stand at 105° of Fahrenheit at midnight; and that too on board a ship riding at anchor in Masoolipatam Roads. Many causes combine to produce so much higher a range of atmospherical heat in the Carnatic than in Bengal. First, the coast in question trends away towards the equinoctial line, while a great part of Bengal lies without

the tropics. Secondly, the soil of the former is gravelly or sandy, and vegetation stunted; whereas that of the latter is clayey, and vegetation luxuriant. Thirdly, the periodical rains that fall, at the change of the monsoon, on the coast, are instantly absorbed by the parched and sandy surface, affording only a very temporary coolness to the air; while an actual and extensive inundation covers Bengal for months together. If, therefore, the nocturnal temperatures of the two places were blended with the diurnal—if, for instance, the thermometer were marked every hour at Madras and Calcutta throughout the year, and the whole averaged, there would be full *ten degrees difference* in the annual mean temperatures of the two presidencies. Bombay is nearly on a par with Calcutta; for although the country surrounding the former is neither flat nor inundated, as in Bengal, yet its northern parallel of latitude, its insular situation, and the mountainous nature of the adjacent country, combine to render the average annual temperature of Bombay as low, if not lower, than that of Calcutta.*

An important, yet unnoticed circumstance, remains to be considered, in estimating the comparative influence and effects of the two climates.—Although sudden vicissitudes of temperature are highly injurious to the constitution in general, and to the hepatic system in particular; yet an *annual* change is eminently beneficial.

* Vide Dr. M'Grigor's Memoir, Edin. Med. and Surg. Journal,

Thus, the first table shews us, that at Calcutta, during four months of the year, viz. November, December, January, and February, the average heat of the day is only 71° Fahrenheit, five degrees *below* the common summer heat of England As for the nights, I can vouch for their being cooler than summer nights at home; since a hoar frost is not an unusual sight on the plains of Bengal, in the mornings of this period; and very gratifying have I found the heat of a blanket at Calcutta in the month of December.

That the Bengalese, and those in similar parallels of latitude, enjoy a kind of *tropical winter*, or exemption from high ranges of temperature, during *one-third* of the year; the effects of which, in relieving the hepatic system from excessive action,—in bracing the whole frame, relaxed by the previous heats, and preparing it to sustain the subsequent ones, may be compared to a short return to our native skies.

This remark will be confirmed by the following analogical observations of Dr. Darwin. “Though all *excesses* of increase and decrease of stimulus should be avoided, yet a certain *variation* of stimulus seems to prolong the excitability of the system: thus, those who are *uniformly habituated to much artificial heat*, as in warm parlours in the winter months, lose their irritability, and become feeble, like hot-house plants; but by frequently going for *a time* into the cold air, the sensorial power of irritability is accumulated, and they become stronger. Whence it may be deduced, that the

variations of the cold and heat of this climate (England) contribute to strengthen its inhabitants, who are more active and vigorous than those of either much warmer or much colder climates.”—*Zoonomia*.

Knowing then, as we do, how uniformly a high temperature affects the biliary organs, and keeping the foregoing facts in view, can we be at a loss to account for the greater frequency of genuine hepatitis in the Carnatic, than in Bengal?—I say genuine, or original hepatitis; for most of those cases which we meet with at the latter place, are the consequences, or sequelæ, of repeated intermittents and remittents, both marsh and jungle.

The same reasoning applies to Bombay, and all other parts of India, whose distance from the equator produces a *tropical winter*, when the sun is near Capricorn; or where peculiarity of soil, elevated situation, or other locality, is incompatible with that high, and almost unremitting range of temperature, so remarkable on the Coromandel coast, and so fully adequate to the derangement of the hepatic functions.

Having thus explained, in I trust a satisfactory manner, the nature of this “local poison,” and how it comes to operate more forcibly in one part than another of the Indian continent, it is necessary to shew why, even in the less sultry parts of the latter—for instance, Bengal, the complaint is still more prevalent than under similar latitudes in the West.

Dr. Saunders quotes, in support of his hypothesis,

the following observation from Hunter on the Diseases of Jamaica. "It is a remarkable thing," says the latter, "that in the East Indies, under the same latitude nearly as Jamaica, that is, at *Madras and Bombay*, the disease known in those countries by the name of Liver, or Hepatitis, shall be the most prevailing disorder among Europeans, and that the same should not be known in the Island of Jamaica." In the first place, there is a geographical error in classing Madras and Bombay in similar latitudes. In the second place, I assert, that there is a difference of ten degrees in the annual mean temperatures of the two places, taking the *hourly average height of the mercury, by day and by night, throughout the year*. In the third place, hepatitis is by no means the most prevailing disease among Europeans at Bombay; dysentery being infinitely more common.* But further, the Island of Jamaica, from its situation in the vicinity of Cancer, must have its "tropical winter," as well as Bengal, and at the same period; while its insular nature, and distance from the American continent, insure it the advantage of sea and land breezes,—the former coming in cool and refreshing, in every direction, from the sea by day; the latter descending cold from the blue mountains by night.

On the contrary, in Bengal, the land-winds are so distressing in April and May, as to oblige the Europeans

* If I afterwards trace a connexion between dysentery and deranged hepatic function, it will not invalidate this position; as the same observation will apply to the dysenteries of the West.

to sit behind tatties, for weeks together, to avoid being stifled with heat and dust. It is far otherwise in the West. Indeed it is computed by Dr. Mitchell, after thirty years observation, that it is as hot in the countries of the old continent, in latitude 29 or 30, as in the countries of the new continent which lie in 15 degrees of latitude. M. De Pauw makes the difference between the old and new continents, in respect to temperature, amount to 12° of the thermometer.—*Recherches Philosophiques.*

“The vernal season in these parts,” (West Indies) says Mr. Edwards, “may be said to commence with May.—The parched savannahs now change their aspect, from a withered brown to a fresh and delightful green. Gentle southern showers presently set in, which, falling about noon, occasion bright and rapid vegetation. At this period, the medium height of the thermometer is 75° .—After these vernal showers have continued about a fortnight, the season advances to maturity, and the *tropical summer* burns in its full glory. During some hours in the morning, before the sea-breeze has set in, the blaze of the sun is fierce and intolerable. But as soon as this agreeable wind arises, the extreme warmth is abated, and the climate becomes even *pleasant* in the shade. The thermometer now stands generally 75° at sunrise and 85° at noon.*

* Compare this with table No. II.— 85° in the morning
 96° at noon.

"But whatever inconvenience the inhabitants of these islands may sustain from diurnal heat, is amply compensated by the beauty and serenity of the nights: the moon rises clear and resplendent in the cloudless horizon—the landscape is fair and beautiful—*the air cool and delicious.*

"In November or December the north winds commence; at first attended with heavy *showers of hail*, till at last the atmosphere brightens, and the weather, till March, may be called *winter*. It is a winter, however, remote from the horrors of northern severity:—*cool, wholesome, and delicious.*"—*History of the West Indies.*

Let this description be compared with that of the coast of Coromandel, and we shall see how easy it is to make a sweeping classification of climates on paper, where little similarity exists in nature.

To return. The average thermometrical range of heat ought to be, and really is, lower at Jamaica by three degrees than either at Bombay or Calcutta; and if so, how much lower than at Madras? In Jamaica, too, though the rainy season may leave swamps and marshes at the debouchures of rivers, yet there is nothing like the great annual inundation of Bengal, occasioning such numerous intermittents, that too frequently terminate in hepatitis.

Here then are the real causes why the last mentioned complaint is more observed, and indeed more prevalent, in the East than in the West; viz. the great superiority of temperature on the Coromandel coast:—and the fre-

quency of intermittents and remittents on the marshy plains of Bengal, or woody and jungly districts of other provinces, as well as of Bombay and Ceylon. To these may be added, the more sudden and extensive transitions of temperature, which take place on the continent of India, than in the islands of the West, owing to the greater degree of equilibrium preserved in the latter places by the surrounding ocean.

"In Jamaica (says Dr. Hunter) the *coolest* month in the year is at least *twelve degrees* hotter than the *hottest* month in our summers." page 174, 3d ed. Now the common summer heat of England is 76° ; consequently the thermometer must stand at 88° in the "*coolest month*" at Jamaica; and that too when there are even "showers of hail," and when the weather is "*cool, wholesome, and delicious!*" Let us compare this with Dr. Blane's account of the West India temperature:—
"The thermometer stands very commonly at 72° , at sunrise in the cool season; rising to 78° or 79° in the middle of the day. In the hot season, the common range is from 76° to 83° . It seldom exceeds this in the shade at sea, and the *greatest* height at which I ever observed it in the shade, at land, was 87° ."
Diseases of Seamen, page 12.

In a very interesting "*Account of Jamaica*," published in 1808, by a gentleman twenty-one years resident at that island, it is distinctly stated that "*the medium temperature of the air may be said to be 75° of Fahrenheit.*" page 21.

In the very same page, with some inconsistency, Dr. H. contradicts his own statement. "It was *hotter*," says he, "than common in the month of June, by *three or four degrees*, the thermometer rising many days to 90°, an unusual heat in that climate." If we take "three or four degrees" from 90°, we shall have 86° or 87°, what Dr. Blane states for the month of June in Jamaica, whereas, he just before made the heat 88° in the "*coolest month in the year*," which is nine or ten degrees too much.

I may here remark, that it must have been from *data* similar to the above, that Dr. H. drew another conclusion—namely, that atmospherical heat has no effect in increasing or deranging the biliary secretion *Page 277.* I shall merely place his opinion in *juxta-position* with that of his friend who quotes him.

Dr. HUNTER.

"A warm climate, it is alledged, increases the secretion of bile, and renders it more acrid. There does not appear to be the slightest foundation for this assertion."—*p. 277.*

Dr. SAUNDERS.

"Such symptoms as I have now enumerated (viz. increased and vitiated secretion of bile) are the spontaneous effects of a warm climate on healthy constitutions, independently of any intemperance."—*On the Liver, p. 159.*

Every author with whom I am acquainted, except Dr. Bancroft, and every one who has observed, or felt the effects of warm climates on his own constitution, will agree with Dr. Saunders.

Lastly, notwithstanding Dr. Hunter's assertion, that "Hepatitis is unknown in Jamaica," when we see so many sallow complexions—emaciated dysenterics—nay, obstructed livers every day returning from the West Indies; when we hear Dr. Moseley, who practised twelve years in Jamaica, assert, that in hot climates a sound liver is never to be expected after death; and Dr. Thomas, another West India practitioner, make use of these expressions—"My own observations, during a practice of *many years* in the West Indies, where Hepatitis is a *frequent occurrence*," &c. &c. [Modern Practice of Physic] we may safely conclude, that in the endemic fevers, particularly the intermittents and remittents of both hemispheres, the hepatic system suffers proportionally in the Islands of the Caribbean Sea, as well as on the banks of the Ganges, or in the forests of Ceylon. Indeed, Dr. H. himself admits, that enlarged and obstructed livers are frequently the sequelæ of intermittents in Jamaica *. Such, it is well known, would obtain the appellation of Hepatitis in Bengal; but Dr. H. will not allow the term, because, forsooth, these affec-

* It is remarked, that the Creole children in Jamaica are subject to liver complaints. Since the first Edition of this work appeared, the documents shewing how much the liver suffers in the West India climate and diseases, excepting perhaps in the concentrated or yellow fever, where the brain and stomach bear the onus of disorganization, have so multiplied, that nothing more may be said on that score. Hepatitis is frequent in Egypt, Coast of Guinea, and Sicily, where the heat is occasionally excessive.

tions of the liver are not very apt to run into suppuration. Many people, indeed, cannot be persuaded that the hepatic functions are at all deranged, unless Hepatitis *in propria forma*, be present.—Is the stomach never disordered except in *gastritis*?

Having ascertained the *quo*, we now proceed to the *quomodo*. I have more than once in this essay alluded to a sympathy, or synchronous action, subsisting between the extreme vessels on the surface of the body, and those of the vena portarum in the liver; a sympathy which, as far as I am acquainted, has not been noticed by any other; and which, if proved, will account for the increased secretion of bile in hot climates, and lead to important practical conclusions. It is, however, in those climates alluded to, where the vessels in question are more violently stimulated than in Europe, that we can most easily and distinctly trace this sympathy. I have remarked, that when we first arrive between the tropics, the perspiration and biliary secretion are both *increased*; and that, as we become habituated to the climate, they both *decrease, pari passu*.

It is very singular that the accurate Bichat should not only have overlooked this circumstance, which is evident to the meanest capacity, but advanced a doctrine quite the reverse. “A cold atmosphere,” says he “confines the functions of the skin, and occasions those of the mucous system to be proportionally extended. The internal secretions are more abundant, &c.” And again. “In warm seasons and weather, on

the contrary, the skin acts more powerfully, and the secretions, particularly the urine, are diminished," *Anatomie Generale*. This is all right, had he excepted the biliary secretion, which follows a law diametrically opposite to this; viz. it is *increased* by a warm, and *diminished* by a cold atmosphere, in the same manner as perspiration.

I have likewise shewn that in the cold, hot, and sweating stages of fever, the two processes are exactly simultaneous and proportionate. The *partial sweats* that break out towards the termination of the hot fit, are accompanied, as Dr. Fordyce remarks, with "*partial secretion*, and irradiations of heat arising from the *præcordia*." I shall now proceed to other examples illustrative of this sympathy. The Asiatic and African, though inured from their infancy to the high temperatures of their respective climates, guard, nevertheless, against *excessive perspiration*, and its too frequent consequence, *suppression*, by keeping the skin soft and unctuous, whereby they maintain an *equable* flow both of perspirable matter and bile. The *former* is evident to the senses; the *latter* is proved by the regularity of their bowels, and their general exemption from bilious or hepatic diseases. "The use of oil" says Dr. Currie, "instead of clogging the pores, keeps the skin moist; and while it guards against *excessive*, promotes moderate and *necessary* perspiration."—279. In our own climate, the gentle diapnoe, or insensible perspiration of *mild weather*, coincides with the regular biliary secre-

tion; while it is in August, when the perspiration is most in excess, that we see cholera morbus, and greatly increased secretion of bile.

Bichat ascertained, by direct experiments, that during the time of digestion in the stomach, the pylorus is closed, and the biliary secretion diminished. We know that a corresponding heat, dryness, and constriction on the surface of the body, are observable at this period. On the other hand, he found that, whenever the chyme began to pass into the duodenum, the biliary secretion was rapidly augmented. We know that, at this very time, the surface relaxes, and the perspiration is increased. Every one knows the effects of emetics and nauseating medicines on the skin and perspiration: the same effects are produced on the biliary secretion. "In all cases," says Dr. Saunders, "where bile is secreted in *too large* a quantity, the use of emetics is improper; indeed, the actions of nausea and vomiting *increase* its secretion." p. 176. This sympathy is equally visible where the secretion is deficient.

If we observe those emaciated objects returning from the East and West Indies with indurated livers, sallow complexions, torpid bowels, and paucity of biliary secretion, we invariably find the skin dry, constricted, and harsh to the feel, without any thing like the softness and moisture of health.

In *diabetes*, where perspiration is notoriously defective, there is the most decisive evidence of diminution in the biliary secretion. "There are, perhaps, few cases

of diabetes," says Dr. Watt, "without some affection of the abdomen, particularly in the epigastric region." p. 47. "Some morbid change," says the same accurate observer, "in the alvine excretion *always* accompanies the diabetic habit. *Costiveness* is perhaps the *most common* of these. In some instances the bowels have been so remarkably torpid, that even the most powerful medicines, in uncommonly large doses, produced but trifling effect." And, speaking of Stevenson's case, he says, "the quantity of alvine excretion was inconsiderable; it had also an *uncommonly white* appearance."—These facts speak for themselves.*

In chlorosis Dr. Hamilton observes that—"the perspiration seems to be checked"—and "I am persuaded," says Dr. Saunders, "that in cholorotic habits, the bile is more insipid—" *is secreted in less quantity*, and of a paler colour than in health." p. 232. "In maniacal habits," continues the last-mentioned author, "there is generally a *defect* in the "secretion of bile." I need not say how marked is the dry, rigid skin, and deficient perspiration, in most maniacs. "Sea-sickness," says Dr. Saunders, "and a sea-voyage, contribute very much to "*restore the secretion of healthy bile.*" The well known effect of these in determining to the surface, and promoting perspiration, especially that gentle diapnoe, cor-

* Are not the kidneys irritated by the non-secreted bile, (or rather the elements of bile floating in the circulation) into inordinate action, in diabetes? Are not the effects of bleeding and mercury thus explained?

responding with healthy secretion in the liver, need not be insisted on. The torpid state of the skin in melancholia, hypochondriasis, and most nervous disorders, exactly coincides with that of the liver and bowels in the same. "Hypochondriacal complaints," says Dr. Saunders, are always attended with dyspepsia and diminished secretion, with great torpor of the alimentary canal."—192. And again, "The symptoms of dyspepsia and diminished secretion, which are now rendered more conspicuous among females, from their sedentary life, are most effectually removed by the means suggested."—viz. sea-sickness and a sea voyage, the very surest means of keeping up a regular and healthy discharge from the pores of the skin.

The same may be said of exercise, which powerfully promotes the secretion of bile as well as perspiration.

There is a curious case related in the Edinburgh Medical and surgical Journal, vol. 2, page 5, where an obstinate dyspepsia [where bile is known to be deficient] could not be cured till the exercise [broadsword] brought on a copious flow of perspiration. In cases of deranged structure and deficient secretion in the liver, Dr. Saunders recommends, what certainly will be found very useful,—"the tepid bath, and small doses of mercury."

Here the bath must act first on the skin, and probably on the liver, from the sympathy in question—while, on the other hand, the mercury, which is known to increase the action in the liver, may produce its diaphoretic effect, from the same consent of parts above alluded to.

All the passions corroborate this doctrine. Fear, grief, and the other depressing passions, when moderate, lessen the secretion of bile--render the skin pale or sallow, and check the perspiration. On the other hand, anger and rage are well known to increase the biliary secretion ; and their corresponding effects on the surface are visible to every eye. Joy, hope, and what may be termed the elating passions, when in moderation, determine to the surface, and keep up a salutary flow of bile and insensible perspiration, so congenial to the healthy functions of the body. I shall adduce no more examples, till I come to speak of dysentery and cholera, which will, I think, afford undeniable proofs of the sympathy in question.

In the mean time, this connexion between two important processes in the animal economy, while it fully accounts for the increase of action in the hepatic system, from the influence of a hot climate on the surface, will be found to elucidate many of the phenomena attending those diseases we are considering ; and perhaps remove the stigma of *empiricism* so commonly attached to their cure. It is allowed that perspiration and biliary secretion are increased by tropical heat, and that the latter is *vitiated*. Perhaps, even here the parallel holds between the two.—How different is the profuse and gross evacuation of sweat, from that insensible halitus, or gazeous fluid, which just keeps the skin soft and smooth in health!

We know that Nature has recourse to the perspiratory process to obviate greater evils that would accure

from accumulated heat :—we have every reason to believe, from analogy, that the increase of the biliary secretion is also a wise mean employed by the same invisible agent, to guard against congestion, and derangement in the hepatic system.

I have shewn, from Dr. Currie, that even “the necessary quantity of perspiration in a hot climate enfeebles the system.” So the increased and vitiated secretion of bile debilitates and renders irritable the whole track of the alimentary canal. “The inhabitants of warm climates,” says Dr. Saunders, “are extremely subject to diseases arising from the increased secretion of bile, and the excess of its quantity in the primæ viæ, which either, by regurgitation into the stomach, produces a general langour of the body, together with nausea, foul tongue, loss of appetite and indigestion, or being directed to the intestines, excites a painful diarrhœa, ultimately tending to weaken their tone, and disturb their regular peristaltic motion.”—*p. 157.*

As bile, especially when vitiated, is certainly apt to gripe and loosen the bowels. it might be supposed, that if it be increased with the cuticular discharge, those whose laborious exertions keep them every day bathed in sweat for hours, would be continually subject to diarrhœas. But nature has admirably guarded against such an inconvenience by establishing what may be termed a *vicarious sympathy* between the skin and the internal surface of the intestines, by which the secretion of mucus, &c. on the latter is diminished, as the perspiration is increased. In temperate climates,

therefore, and among the laborious classes of society, this increase of the biliary fluid is productive of little or no mischief, being all expended during the digestion of their food, which is generally composed of such materials as require strong organs and powerful fluids for that purpose.

“————— Their daily labour thaws
To friendly chyle, the most rebellious mass
That salt can harden, or the smoke of years.”

But it is very different with Europeans in hot climates. There the vicarious sympathy is not always able to keep in check the diarrhoea; and when it is the superabundant secretion of bile accumulates in the primæ viæ, producing all the symptoms above enumerated, till its quantity or quality raises a commotion in the bowels, in consequence of which it is expelled. Hence the impropriety of attempting athletic exercises in the heat of the day between the tropics, which must greatly increase the ill effects described.

These then are the penalties (aggravated, indeed, too often by our own misconduct) which are incurred, more or less, by emigration from a temperate to a torrid zone! They are the mild inflictions, however, of Nature, wisely calculated, and providentially designed, to ward off more serious evils. They must be continued long before they induce actual and dangerous diseases; and I am convinced we might, in general, escape the latter, by exercising our rational faculties in observing and rendering subservient to our use, the simple, but salutary operations of Nature. After having been severely taught to feel the ills I am going to portray, it is still a most pleasing task to trace the wisdom and be-

nevolence of our Creator in what might seem the imperfection of his works.

We now proceed to the more serious injuries too frequently resulting from these spontaneous, but salutary efforts of the constitution, when counteracted or goaded on by our own injudicious management, or by unavoidable accidents.

I have shewn, on the authority of Dr. Currie, that excessive perspiration occasions a loss of tone in the extreme vessels; in consequence of which, the perspiratory fluid continues to be poured out *after* the cause or necessity has ceased to operate. It is precisely the same with respect to biliary secretion. He has likewise observed that, in the last-mentioned state, the application of even a slight degree of *cold* is pregnant with danger. It certainly is so; and on more accounts than one. For not only is the animal heat too rapidly abstracted, but the extreme vessels on the surface, and likewise those of the *vena portarum*, are instantly struck torpid; the perspiration and biliary secretion are arrested; the passage of the blood through the liver is obstructed; and a temporary *congestion* throughout the portal circle is the result.

This view illustrates, and is at the same time confirmed by, the observations of two physicians in very different and distant parts of the world. Dr. M^GGrigor remarks, that during the march of the army over the sandy desert of Thebes, where the thermometer frequently stood at 118 in the soldiers' tents, the health of the troops was equal to what it had been at *any* former

former period in India. "Heat of itself then," says he, "does not appear to be the *principal* cause of the prevailing diseases." It certainly is not; but when excessive and long continued, it induces that state of the vessels on the surface, and of the liver, which is easily thrown into disease by the sudden application of slight degrees of cold. This accounts for Dr. Moseley's paradox, that "*cold* is the cause of almost all the diseases in *hot* climates, to which climate alone is necessary." He refers the mischief here entirely to checked perspiration; but the connexion which I have traced between this and *internal* mischief, will more amply elucidate this affair. Thus, in the months of April, May, and beginning of June, at Calcutta the heat is considerably greater than during the subsequent rainy months; but perspiration, though profuse enough, is steady and pretty uniform, and the only diseases are those from increased secretion of bile. From the middle of June, on the other hand, the close, humid, and sultry atmosphere, is attended with an absolute exudation from every pore of a European's body; in which state the chilling application of rain—the raw, nocturnal vapours—or the atmospherical vicissitudes of autumn, will produce, as may easily be conceived, the effects I have described above, the consequences of which will be fever, dysentery, or both.* It is on this account that the Bengalese are observed to be more assiduous in using oily frictions at this period than at any other. They know, from experience, that by such precautions they are enabled

* Vide Section on Bilious Fever.

maintain a more *uniform* discharge from the pores, to check profuse perspiration by day, and to obviate the effect of rain or cold by night.

On the Coromandel coast, however, where the range of temperature is higher and more permanent; where the duration of the rains is short; where the nights are either hot, as during the hot land-winds, or temperate, dry, and clear, as at other times, the deterioration of the hepatic organs is slow and gradual, *where temperance and regularity are observed.* But among heedless sailors, soldiers, and others, who, to the stimulating effects of the climate, and inebriety, too much food or ill-timed exercise, then the biliary secretion and perspiration are so hurried and augmented, and the vessels so debilitated, that the smallest atmospheric vicissitude becomes dangerous.†

The effects resulting from the application of cold under these circumstances, will be in all degrees, from a slight shiver to a fever, or even instant death. We will suppose them only in a low degree. During the temporary torpor of the extreme vessels on the surface, and of the vena portarum, the pori biliarii and excretory ducts will partake of the same atony, and the bile will stagnate, till the re-action succeeds and propels it forward in its accustomed course, with a degree of acceleration proportioned to the previous quiescence. It is plain, that by frequent repetitions of this, the vessels and ducts in question will lose tone; and as atony is the

† See the Section on the climate of Egypt in the Mediterranean division of this Work, where the foregoing reasoning is still farther elevated, and confirmed.

parent of spasm, constrictions of the ducts must at these times take place; the bile will become viscid, occasionally, from stagnation, and be with more difficulty brought forward into the intestines during the subsequent increased action of the vessels. Thus obstructions will form, and an inflammatory constantly impending, till time, or some accidental aggravation of the causes above-mentioned, kindles up *HEPATITIS*, which will run rapidly into suppuration, and perhaps in a few days destroy both the organ and the life of the patient, unless it be skilfully checked in its career.

If, during this catastrophe, we expect to find the pathognomonic symptoms of acute Hepatitis, as it appears or is described in Europe, we will be greatly deceived. In *comparatively* few instances have I seen the violent rigors, high fever, hard, quick, and full pulse, acute pain, &c. which we would naturally look for as preceding the destruction of such a large and important viscus.

Such cases, however, pretty frequently occur, during the first twelve or eighteen months after arriving in the country. A young gentleman of great abilities, and a good constitution, but who despised all curbing rules of temperance or precaution ran about in the sun for some days at Malacca, indulging in all sorts of licentiousness and inebriety; and was seized in a day or two afterwards, on our passage to China, with rigors and heat alternating; succeeded in a few hours by pain in the right side, extending across the pit of the stomach, accompanied with some difficulty in respiration. He did not send for me till twelve or fourteen hours after

the attack. He had then high fever—hard, quick pulse—great dyspnœa—a short cough, and the most excruciating pain in the region of the liver. Although I had then been accustomed to treat Hepatitis as it more usually appears in India, and this gentleman had been a voyage to Bengal in a Company's ship before he joined us, yet the disease had so decided a European character, that I determined on employing the European method of cure. Accordingly, blood was drawn "*pleno rivo,*" from his arm, and repeated twice the next day. His bowels were kept open with saline cathartics; and antimonials, in nauseating doses, were prescribed, to relax the surface, which was dry and burning. By these means the febrile symptoms were greatly mitigated, and blisters to the side seemed to relieve the local affection. He still, however, had great tenderness on pressing the right hypochondre; and on the fourth day he complained of having a flux.

I knew but too well how sure an index this was of mischief going on in the liver. I therefore commenced the administration of mercury without delay. But, while endeavouring to saturate the system with this medicine, we were overtaken by a most violent typhoon, or hurricane, in the Chinese seas, which kept the ship in the greatest agitation, and completely drenched with water, for many days together. I had reason to believe, that he neglected at this time to take his medicines, and I was not able to pay minute attention to him myself. The flux was now the prominent symptom, and, though I used every exertion I could never afterwards affect his mouth with mercury.

A fulness soon appeared in the right side; while the shiverings, cold sweats, and lastly, the colliquative diarrhoea, that terminated the scene, left no doubt that abscess had not only formed, but burst internally. He dragged out a miserable existence of more than three weeks from the commencement, and died at the island of Lintin, where I inspected the body.

Before his dissolution, the discharge *per anum* was purulent, and dreadfully foetid. A few hours before his death he vomited a similar matter, and then sunk rapidly, retaining the possession of his mental faculties till the last moment; and regretting his inattention to the advice I had often given him, previous to his illness, warning him against the effects of intemperance and exposure to the heat of the sun.

On dissection, the liver was found one entire mass of suppurations and disease. I passed my hand from it into the stomach, to which it adhered, and through which an abscess had burst. Another adhesion had formed between the liver and the transverse arch of the colon, through which was an exit also for the matter. In short, scarce a trace of healthy organization was to be observed at any distance from the convex surface of this organ, which part alone preserved anything like a natural appearance.

I met with few cases in India, so exquisitely marked with acute European symptoms as this. But in all those which exhibited traits at all approximating to the above, I delayed not a moment in commencing the mercurial treatment, *in conjunction*, with the antiphlo-

gistic; the *latter* being carried no farther than the inflammatory symptoms appeared to require; the *former* continued uninterruptedly till the full effect was produced, and till every shadow of danger was gone.

Such instances as these cannot be mistaken; they can too often be traced to evident and adequate causes; such as intemperance—violent exercise in the sun—or sudden exposure to cold when the body has been some time in a state of perspiration. They will occur principally among those lately from Europe, or at least within a year or two after their arrival; and such symptoms will be, in most cases, confined to the young, the robust, and plethoric habits.

But in general, the disease makes its approach in a much more questionable shape, though equally pregnant with danger as the foregoing, and not seldom more rapid in its course. A man comes to us, complaining of having a flux. He says he is frequently going to stool—that he is gripped; but passes nothing but slime—that his stools are like water, or some such remark. It is ten to one if he mentions any other symptom at this time. But if we come to interrogate him more closely, he will confess that he has had some soreness at the *pit of the stomach*, or perhaps in the right side. If we examine the part, a fulness will sometimes appear—if we press upon it, he starts back, or shrinks at least from the pressure.

If we look into his countenance, besides a certain anxiety we will observe a dark kind of sallowness in his cheeks, and a yellowish hue in his eyes. The lat-

ter is seldom absent in hepatic diseases, both in India and Europe.

The temperature of the surface will probably not be much increased; but the skin will have a dry feel—his mouth will be clammy, and his tongue have a whitish or yellow fur towards the back part. His pulse, though neither hard nor very quick, will have an irritable throb, indicative of some internal affection. His urine, if inspected which it always should, will be found to tinge the bottom and sides of the pot with a pink sediment, or turn very turbid a few hours after it is voided; and he will generally complain of some heat and scalding in making water.

These are all the external marks we can perceive; and the few symptoms at the head of the list are all that the heedless soldier or sailor has noticed, or at least recorded. Happily for the patient, as well as his physician, the degree of violence in the bowel complaint, whether other symptoms are not conspicuous, will be almost always a sure index to the rapidity or danger of that in the liver. Whereas in those cases where the symptoms are of the violent or European cast—particularly pain, fever, and dyspnœa, the bowels are very frequently costive for the first few days of the complaint.

If it is not early checked, it will frequently run on to suppuration, like the case described, and then the chance of its pointing, or of the matter finding its way through ducts or adhesions, with ultimate recovery, is faint indeed. Other symptoms will occasionally arise

in this disease, or accompany it from the beginning. Thus, the fever is sometimes smart; the enlargement, hardness, or tenderness of the part, more violent; the inability of lying on a particular side may be complained of; a short cough may attend; or that particular sensation in the acromion scapulae may be noticed, though it is not very often that this last is present.

These symptoms, and the duration of the complaint, will vary much. Indeed, the latter is very uncertain; as its continuance may be protracted to several weeks, without suppuration or organic derangement of vital importance following.

This, then, is the hepatitis of India; and certainly there is no small dissimilarity in symptoms, between it and the acute hepatitis of Europe. The flux, which may be termed the pathognomonic of the former, is almost always wanting in the latter. The one (Indian) partakes more of inflammatory congestion and obstruction; the other of active inflammation, like that of the lungs, kidneys, &c.

Such are the marks that are to guide the practitioner when the disease is present. An attention to the following premonitory symptoms, described for the use of the more intelligent class of patients, into whose hands this essay may fall, will probably save them many a nauseous dose, and many a tedious day's illness.

In all bilious diseases, the *mind* is much affected. When hepatitis is impending, it loses a portion of its wonted firmness. Our spirits are unequal; we are occasionally gloomy and irritable; and apt to see things

through a distorting medium. This too frequently drives patients to have recourse to those very means which hasten on the fatal catastrophe, but which give a temporary relief to disagreeable mental sensations, that are only symptomatic of the corporeal affection—I mean, an indulgence in the fugitive pleasures of the bottle.

The eye and countenance assume the appearance alluded to before, termed Bombycinous by Dr. Darwin; and the urine becomes high-coloured, or tinged with bile; and almost invariably produces considerable scalding in its passage through the urethra. Dyspeptic symptoms arise, and generally mislead the patient into a belief that his complaint is only indigestion. After any thing like a full meal, we feel a most uneasy load and sense of oppression about the pit of the stomach, which are relieved by yawning, stretching, or standing up, and aggravated by stooping, or the recumbent posture. The digestion is never equal to the appetite, though the latter is often deficient;—and this leads to irregularity in the bowels. One day, there are dark, clayey stools, with costiveness; another, they are fœtid and slimy, with flatulence and looseness. The skin has not the moist, soft feel of health; but often a dryness, with partial clammy perspirations, and irregular flushes and chills.

We may not feel, at this time, any pain on pressing the region of the liver; but a short and unexpected step on uneven ground, will frequently cause a most unpleasant sensation at the pit of the stomach, or in the right

side, as if something dragged there. Indeed, if the patient be attentive to his own feelings, some internal uneasiness will always be found to precede the pain on external pressure; at least I invariably found it so in my own person, and it has more than once admonished me of my danger.—The same remark has been made to me by intelligent patients. Disturbed sleep, and frightful dreams, precede and accompany this disease, in almost every case. Nothing harassed me more than this unpleasant symptom; and on *inquiry*, I always found my patients make the same remark; but they will seldom mention this, unless they are interrogated.

When all, or several of these symptoms, make their appearance, a few doses of calomel and cathartic extract, administered so as to keep up a regular increase of the alvine evacuations for some days, together with the strictest abstinence and caution in avoiding the extremes of heat, or sudden vicissitudes, will often anticipate the attack of this insidious disease, and entirely check it in embryo. If these means, however, do not remove the morbid train of premonitory sensations above described, mercury should be slowly introduced, so as to produce a brassy taste in the mouth, and kept at this point till the return of health, and strength, which would hardly ever fail to result.

It will be readily understood, that the warning symptoms above mentioned, can only be expected where the disease is coming on gradually, from effects of climate, and the more moderate application of such causes as hasten these effects. Where the *excitantia* are strong

and evident, such as great intemperance; sudden exposure to considerable atmospherical vicissitudes, particularly to cold after perspiration; violent exercise, &c. then the interval between them and actual disease, will not always afford many admonitory sensations, or permit us to put in force the very desirable precept of the poet—

“Principiis obsta :—venienti occurrite morbo.”

TREATMENT.

The medical practice of India is more simple than that of Europe, evidently from the great connexion which experience has traced between many *apparently* dissimilar diseases in the former country; rendering it only necessary to vary, in some degree, the same methodus medendi.

During the first twelve months after arriving in the country; whenever the patient was at all robust, the pyrexia evident, or the pain considerable, I bled at the the very *commencement*, and not with a sparing hand. I did so with a two-fold view. One was to relieve the febrile symptoms, by lessening the inflammatory congestion in the liver and portal circle; the other, to lower the tone of the constitution, which, experience taught me, accelerated the effect of that medicine on which my principal reliance was placed. To further both these objects, one or two doses of calomel, or the pil. hydrarg. with opium and antimonial powder, were given,

and followed by castor oil or jalap, which never failed to bring down a copious alvine discharge, consisting of any thing but natural fœces, or healthy bile. For in the flux attending hepatitis, the violent straining and griping are succeeded by nothing but mucus and blood, accompanied by a distressing tenesmus, *unless* when laxatives are taken, and *then* diseased secretions only, with occasionally a hardened scybala, or other fœcal accumulation, are passed.

It appears, by Mr. Curtis, that the hospital practice at Madras in his time, [thirty-five years ago] was to give three grains of calomel, with some rhubarb and soap, night and morning, till ptyalism came on; and if it was necessary to have the mouth sooner affected, a drachm of mercurial ointment was rubbed in on the affected side every night. No opium was then thought of; but the hypothetical prejudice against that valuable article is now, I believe, pretty well worn off; and I know, from pretty ample experience, that, in conjunction with antimonial powder, it forms a most admirable auxiliary to the mercury; not only soothing many uneasy sensations of the patient, but determining to the surface, and promoting a diaphoresis, which is of infinite service in this, as in most other diseases.

In all *urgent* cases, I seldom gave less than twenty-four grains of calomel in the twenty-four hours; and generally in the following manner:—R. Submur. Hydrarg. gr. vj ; Pulv. Antimon. gr. iij; Opii, gr. ss. M. si bolus—sexta quaque hora sumendus,

During the exhibition of these medicines, an occasional dose of castor oil, or rather laxative, and emollient injections, contributed to mitigate the griping and tenesmus; while blisters and leeches often relieved the local pain of the side. But these were only secondary considerations; and the grand object was to get the mouth affected, when the flux and other symptoms were sure to give way.

The secretion of healthy bile—the flow of saliva from the mouth—and a gentle and uniform perspiration on the skin, were synchronous effects of the medicine, and certain indications of the approaching cure. But it was necessary to keep up these by smaller doses of the medicines alluded to, not only till every symptom of the disease had vanished, but till the clear countenance, keen appetite, and regularity of bowels had returned, and health and *strength* were completely restored.

Indeed, a degree of obesity generally succeeds the administration of the medicine, and the cure of the disease; nor need we wonder at this, when we consider the previously deranged state of the digestive organs, to which a renewed energy is now communicated.

But, in effecting these salutary objects, I have often been obliged to push the mercurial treatment in a much bolder manner than above described. I have myself taken calomel in twenty grain doses, three times a day, without experiencing the slightest inconvenience from the quantity; nay, I always found large doses sit easier on the stomach, and occasion less irritation in the bowels than small ones. At this time, too, I

was using every exertion, by inunction, to forward the ptyalism; yet it was several days before I could produce any effect of this kind. These doses may astonish those who do not know the difficulty of affecting the mouth with mercury in a hot climate, when the liver is verging to suppuration. The idea of their purging and griping at these times is truly chimerical. Indeed, I never saw any of those terrible cases of hypercatharsis which people so much talk of, except where cold was applied; and perspiration checked during salivation, when certainly, as may naturally be supposed, a severe bowel complaint is the consequence.* But in that dangerous state, of the liver which I have mentioned, when a few hours, perhaps, must determine, whether healthy secretion or destructive suppuration is to result, a tardy, irresolute practice, is pregnant with mischief. Unfortunatly, at this critical period, such is the torpor throughout the lacteal and lymphatic vessels of the abdomen, that the largest doses internally, and the most assiduous inunctions externally, will sometimes fail in introducing a sufficient quantity of Mercury to saturate the system. In the mild climate of Prince of Wales's Island, where the temperature of the air might be supposed to favour absorption, I have had a couple of Malays daily employed, for hours at a time, in unsuccessful frictions, the lymphatic vessels refusing to take up the ointment

“*Gravis viginti per frequenter usus sum, quis autem, quotidiano, adhibitis aliquid incommodi, aut periculi, tali ab exhibitione pervenire nunquam observavi.—Thesis on Hepatitis, by T. B. Wilson, M. D. Surgeon, R. N. 1817.*

in any considerable quantity. At the commencement of this disease, and of dysentery, I have often been able to form a tolerably accurate prognosis of the difficulty that would be experienced in raising ptyalism, by observing the aptitude of the absorbents on the surface, while a drachm or two of mercurial ointment were rubbed in on the thigh or arm, under my own inspection. This hint may be worth attending to. Here the tepid bath, by determining to the surface, will sometimes so far restore the balance of excitability and circulation as to promote the absorption of the mercury, both from the external and internal surfaces of the body. But great care is to be taken to avoid a subsequent chill, and a consequent recoil of the circulation, which will be sure to aggravate all the symptoms instead of relieving them.—The nitro-muriatic acid is also to be used in these cases. The absorption of mercury into the system is also accelerated by causing the patient to swallow a considerable quantity of warm diluting drink, as thin water-gruel, every night at bed time.

It might be expected that I should here point out the predisposing and exciting causes of Hepatitis; but these have been in a great measure anticipated by the preceding remarks. I observed, that the application of cold to the body, during and subsequent to perspiration, was by far the most frequent manner in which the disease was contracted; but the European, and the casual visitor, may well wonder how cold can be often applied on the burning coast of Coromandel, where the temperature is high and steady by day—where the nights are,

for months together, hot—and seldom raw or damp, as at Bombay or Bengal. A nearer inspection dispels the difficulty, and shews us that nothing is more common than such an occurrence. The European soldier or sailor, exhausted by exercise in the heat of the day, and by profuse perspiration, strips himself the moment his duty is over, and throws himself down opposite a window or port, to inhale the refreshing sea-breeze; his shirt, in all probability, dripping with sweat. The effect of this present gratification is well exemplified every day before his eyes, by the officers of his ship or regiment, who, when *hobdaars* and salt-petre are not at hand, refrigerate their wine or water, by suspending the bottles in wetted cloths (generally worsted or woolen) and exposed to a current of air, when the evaporation, in a few minutes, renders the contained fluid quite cold.

It requires more philosophy or self-command than generally falls to the lot of the aforesaid classes, to resist the grateful refreshment which this dangerous indulgence affords. The dreadful sensations arising from heat and thirst imperiously demand fresh air and cold drink, which few have stoicism enough to forego, even where the bad consequences are previously known. I shall have occasion, hereafter, to relate some fatal instances of this kind, which happened under my own eye. The night, which nature designed as one of the grand restoratives of our energy, is the time when many imprudent exposures, of the species described, are made among sailors and soldiers; particularly the former, on account of the close and sultry apartments in which

they sleep, whereby they are forced to make frequent nocturnal visits to the open air, while they are streaming with perspiration.

It is asserted by almost all writers on tropical climates, that atmospherical vicissitudes are comparatively trifling in those regions, and that the thermometrical range is seldom of greater extent, than from five to ten degrees daily, and fifteen or sixteen degrees annually. "In countries between the tropics," says Dr. Moseley, "the heat is nearly uniform, and seldom has been known to vary through the *year*, on any given spot, either by *day or night*, 16 degrees."—p. 2. This is not correct: the thermometer, at Bombay and Calcutta, in the month of January, is frequently as low as 55° in the night: and in the month of April up to 90°, or even higher, in the day; making an annual vicissitude of thirty-five degrees. And, notwithstanding Dr. Moseley's assertion to the contrary, a transition of eighty degrees, *in one day*, has been witnessed between the tropics. Sir James M'Gregor, in his Report to the Medical Board at Bombay, for the month of November, 1800, observes that, "the mercury had an extraordinary wide range, from 68°—50° to 130° in the open air."—*Edin. Med. and Surg. Jour. July, 1805*, p. 271. And he shortly afterwards adds—"More cases of *Hepatitis* appeared than in either of the two former months."—ib. But even on the Coromandel coast, the *actual* vicissitude to which the human frame is often exposed, far exceeds what is generally believed. Let a thermometer be suspended in the open air at Madras, and it will point for

many hours in the day to 120° or 130° , but in the night it will fall to 80 or 82° . Here, then, is a range of 40 or 50 degrees in the day, to which hundreds of European soldiers and sailors are unequivocally exposed; for, let it be remembered, that they are kept neither in glass cases, nor the cuddies of Indiamen, though the above consideration ought to intercede powerfully in their behalf, and induce their officers never to subject them to such dangerous vicissitudes in a climate of that kind, unless from inevitable necessity.

But this subject will meet with a very full consideration in the prophylactic part of this essay, where I hope to offer some important remarks on certain means of preserving health in hot climates, connected with the above topic, which have been hitherto passed over unnoticed or misunderstood by medical authors.

I need hardly remark, that intemperance in spirituous liquors strongly predisposes to and excites Hepatitis. But it is not generally known, or suspected, that the depressing passions, particularly grief, have the same effect. I have seen many instances, however, where no doubt could be entertained on the subject. I shall only relate one. In the month of December 1803, while H. M. S. Centurion was lying at anchor in Mocha Roads, two men, when in the act of loading a gun, had their arms blown away, and were otherwise dreadfully shattered, by the gun going off, in consequence of the neglect of a boatswain's mate, who was captain of the gun. One of the men died, and the circumstance produced such a degree of remorse and grief in the mind of the

careless boatswain's mate, that he was instantly seized with Hepatitis [though in the prime of life and health] and in a few days followed his unfortunate shipmate to the grave!—The close sympathy which subsists between the *brain and liver* is well known, and strongly illustrated in hot countries, where the latter organ (like the lungs in Europe) being pre-disposed to disease from the general effects of climate, suffers readily and obviously, in consequence of the sympathy in question.

I shall now make a few observations on those chronic derangements in the liver and its functions, which, in hot climates, succeed violent or repeated attacks, such as I have already described. These derangements, however, (especially of function,) are but too often the consequence of long residence between the tropics, independent of any serious or acute inflammation in this organ. Where induration, enlargement, or any particular structural alteration has taken place, the external accompaniments are evident to the most superficial glance.

Sallow countenance—emaciation—irregular bowels; high-coloured urine—scalding in its discharge—low spirits—often a chronic flux, with pain, fulness, or hardness in the region of the liver—evening fever—dry cough; and swelling of the ankles, are the prominent features of this deplorable malady. A degree of induration and enlargement continued nearly three months after a severe attack of Hepatitis which I experienced in my own person; and a distressing bowel complaint succeeded, and harassed me for more than a year.

A return to Europe brought me no relief; on the contrary, by getting cold in my feet, while sitting in a dissecting room in London, a few weeks after my arrival, a violent Hepatitis was induced, accompanied by the usual dysenteric symptoms. The flux that preceded, for so many months, this last relapse, may serve as a specimen of those connected with chronic hepatic obstruction.

Once, perhaps, in the twenty-four hours, generally in the morning, there would be an ill-conditioned foecal evacuation, accompanied with mucus, slime, and apparently vitiated bile. After this, I would have two, three, and sometimes four hours' respite. An uneasy sensation would then arise in my bowels, with rumbling and flatulence, which would proceed along the whole track of the intestines, when I was forced suddenly to stool, nothing, however, coming away, but some slimy mucus, streaked occasionally with blood, or greenish, bilious sordes. This discharge was always attended with more or less griping, straining, and some slight degree of tenesmus; after which another interval of ease, two or three hours in duration, would take place, and then the same symptoms as before described, continuing with great punctuality, for weeks and months together. During this period, my appetite was tolerably good, but my spirits exceedingly irregular—generally depressed. The least excess in eating or drinking—the exposure to night air—or the slightest application of cold to my feet, aggravated my complaint. The cheering prospect of returning to my na-

tive home, and the hopes that climate alone would effect a cure, together with the want of accommodation for undergoing a course of medicine on a voyage, where I was only a passenger, induced me, most unwisely, to delay the only effectual means of curbing the disease; till a nearly fatal relapse forced me to have recourse to that medicine which more than once before preserved my life. The flux, which all this time was symptomatic of liver obstruction and irregular secretion, was completely removed with the original cause.

Two circumstances appear to be almost always attendant on these chronic diseases of the liver—diminished secretion of bile, and low spirits. The former we may account for in two ways: either as resulting from that atony which takes place in an organ that has been long stimulated into inordinate, or at least irregular action, by hot climates, &c. or from structural derangement, generally induration, which but too often accompanies the preceding state. It is likewise certain, that the bile is vitiated in quality, as well as deficient in quantity. And the numerous complaints which we hear from people, with evidently torpid livers of *excessive secretion*, which they conclude must be the case, from the nausea, vomiting of green bile, sick head-aches, yellowness of the eyes, gripes, &c. with which they are occasionally harassed, arise from irregular, but on the whole, diminished and disordered biliary secretion.

I do not think the ingenious Dr. Watt has been very happy in his pathological elucidation of bilious diseases.

—“The liver,” says he, “receiving its stimulus from venous blood, has more to do than in health; hence the origin of bilious complaints, which, with low spirits, and prostration of strength, generally mark the first stage of disease.”—p. 207.

The liver may have *more to do* in bilious diseases than in health; but I am well convinced *it does less*. The torpor in that organ keeps a general plethora throughout the abdominal system of black blood; consequently, when it happens to be occasionally excited into unusual action, a greater flow of vitiated biliary secretion ensues, from this very cause; when, unless, proper means are employed, the viscus falls back again into its previous state of inactivity. This view of the subject elucidates the effects of venesection, purgatives, and all the best remedial processes.

The torpid state of the bowels, dependent on that of the liver, admits of morbid bilious accumulations (after those periods of excitement) which lurk about the duodenum, or regurgitate into the stomach, by inverted peristaltic motion, producing all the phenomena alluded to. But, in a great proportion of patients, the torpidity of the alimentary canal is seldom roused by the acrimony of the bile; costiveness and low spirits going hand in hand, with the most obstinate uniformity.

The increase and amelioration of the biliary secretion, then must always be kept in view, when treating this chronic obstructed, or torpid state of the liver.

The connection which I have traced between the biliary and perspiratory processes, will elucidate the

operation of those means of relief, which experience has determined; it will also suggest the use of some others. Among the remedies for this complaint, mercury, given in small doses, and slowly, so as to keep up a brassy taste in the mouth for some time, holds a distinguished rank; as it effectually promotes the secretion of bile, and excites the extreme vessels on the surface.

To increase the latter effect, however, it has been found useful to combine with it a small proportion of opium and antimonial powder, both to guard the bowels from irritation, and determine to the skin. It is quite evident, and ought ever to be kept in mind, that no *violent means* should ever be used in stimulating an organ to action, whose torpor or derangement has proceeded from this very cause. The state of the liver here may be compared to that of the stomach in a worn-out drunkard. It requires stimulants; but they must be nicely managed, else they will be productive of mischief instead of utility.

The next most salutary remedial process, is to keep up a regular peristaltic motion in the bowels, and excite the mouths of the excretory ducts of the liver, which will tend to eliminate the viscid and depraved secretions from that organ itself. I have found no medicine better adapted to this purpose than the following:—R. Ex. Colocynth. Comp. drachmam. Subm. Hydrarg. gr. xx. Antim. Tartarisat. gr. iv. Ol. Carui, gt. viii. M. Fiant pilulæ No. xxx. Vel. Ex. Aloes spicat. scrupul. Pulv. Antimonialis. gr. x. Pil. Hydrargyri. scrupulos duos. Ol. Carui, gt. vj. M. Fiant pilulæ No. xx.

One or two of these pills, taken occasionally at bed-time, will move the bowels, gently next morning; carry off diseased, and promote healthy secretions of bile; and will be found to obviate, in a wonderful manner that mental despondency, and long train of nervous symptoms, so constantly attendant on this complaint.

Our attention is next to be directed to the cuticular discharge. This is never to be forced by heating or stimulating, but an insensible halitus promoted, by the most gentle means. Moderate exercise, particularly gestation, as determinating to the surface without fatigue, is highly useful. A sea voyage, combining these advantages with a more equable temperature, and keeping up a slight nausea, as it were, by which the cutaneo-hepatic secretions are increased, will be found beneficial where it can be commanded. The swing, an easy, and perhaps no bad substitute for gestation, or a sea voyage, I found very useful in my own case. I was led to try it for amusement only, and to dispel the ennui of protracted convalescence. It certainly has considerable effect on the skin—powerfully determines to the surface—and relieves those internal congestions so connected with, and dependent on, torpor or obstruction in the liver. The assiduous and daily application of the flesh-brush over the hypochondriac region, will be found to excite the healthy action of the biliary organ in no mean degree. Blisters, or the more permanent drain of a seton in the side, where there is much local uneasiness, will likewise be had recourse to with advantage.

Flannels are essentially necessary, more particularly in the variable climate of this country, with the minutest attention to the warmth and dryness of the feet, especially where the bowels are tender. In torpid livers, where costiveness is a common symptom, flannels, by increasing the cuticular discharge, appear at first to constipate. But here, as in the costiveness arising from a sea voyage, no ill effects whatever are induced; on the contrary, the digestion improves, evidently from the biliary secretion being augmented in both cases.

On the other hand, where hepatic obstructions exist, with determination to the bowels, keeping them in an irritable state, as in my own case, the utility of flannels becomes both real and apparent.

In addition to the general use of flannel, the local application of a bandage of the same round the waist, in imitation of the Indian *cummerband*, is in these cases peculiarly advantageous. The native soldiery in India often contract bowel complaints from incautiously throwing off the *cummerband*, when heated on a march. I could state numerous instances, where the worst consequences resulted from negligence in this respect.

The tepid bath, using the utmost caution in avoiding a subsequent chill, will evidently be serviceable, on the same principle; as well as the warm mineral waters taken internally, as recommended by Dr. Saunders. The night air and late hours, are to be most religiously avoided; and a rigid temperance, amounting to abstinence, enjoined. In short, he who labours under obstructed liver, and hopes to protract his existence with

any kind of comfort to himself, must abandon what are called the “pleasures of the table;” but which are, in reality, the bane of human health. Quantity is doubtless of more consequence than quality; yet raw vegetables and pastry, from their increasing acidity and rancidity in the stomach, are very generally detrimental. Tender animal food, in small quantities, with well baked bread, or ship-biscuit, forms perhaps the most easily digested aliment in such cases. In India, and I believe in Europe, rice and curry will be found a salutary dish. The stimulus of the spice is very different from that of spirits or wine; and the rice is, without exception, the most unirritating, nutritious, and easily digested vegetable, which the bountiful bosom of the earth produces.

With respect to drink, although I certainly would recommend to my patient the laconic Greek prescription in the pump-room at Bath ; yet I fear that most of those returning from the East and West Indies, afflicted with hepatic complaints, while they readily allow that “water is best,”—nevertheless, unanimously agree, that wine is most palatable. If the latter cannot be dispensed with, the acid and astringent kinds, at least, are to be rejected. Malt liquor will seldom agree, and spirits ought to be restricted as much as possible. I know well, that a dilute mixture of brandy and water has an indescribably soothing effect on the stomach and bowels, in these cases, and *seems* both to agree best, and prove most useful ; but I am fully convinced it ultimately injures the tone of these organs, and increases the mischief in the

liver, unless it be taken in the most guarded manner. Water upon the whole is best.

All the preceding remarks pre-suppose that a change of climate has been effected ;—for such is the state of the biliary organ, after repeated attacks of Hepatitis, or a long residence between the tropics, that the most active of the above-mentioned remedial means will give but temporary relief, while the original cause continues to be applied.

I shall elucidate this more fully hereafter, when treating on dysentery. And yet the removal from a tropical to an European climate, requires caution. Nature abhors extremes and sudden vicissitudes. It certainly is dangerous to return to this country in winter, as I myself experienced. I landed in January, and before the end of February, I had a complete relapse of Hepatitis, and its accompaniment, flux.

Those who cannot undertake the long and expensive voyage to Europe, should endeavour to change a continental for an insular situation in India. Pulo Penang, or Prince of Wales' Island, though within six degrees of the equator, enjoys a milder air, and a lower range of temperature, than any of the presidencies. Here are neither the great vicissitudes of Bombay, the marsh effluvia of Bengal, nor the scorching heat of Madras. The climate is very salubrious. On the mountain, which, occupies a great part of the island, and is of considerable elevation, bungalows, are erected, open to the sea and land breezes, where the thermomcter ranges between 70 and 80 degrees, and where the heat is never

reflected or oppressive. From this mountain, too, the most romantic, extensive, and picturesque views, are presented to the delighted eye, contributing greatly to mental amusement and corporeal renovation.

A temporary residence on that beautiful island, during a painful illness and tedious convalescence, has produced in my mind a strong local attachment towards it, and a vivid recollection of its enchanting scenery.—

Illa terrarum mihi præter omnes
Insula ridet, ubi non Hymetto
Mella decedunt, viridique certat
Bacca venafro ;
Ver ubi longum, tepidasque prœbet
Jupiter brumas ; et amicus Aulon
“ Gracili palmæ,”* miniūnum falernis
Invidet Uvis.

The Malayan peninsula, from its being a narrow slip of land, washed on both sides, and nearly encompassed by the ocean—constantly covered with verdue, and open to the sea breezes, is blessed with a milder and cooler air than any continental part of India between the tropics, and bordering on the coast.

Columbo, in the Island of Ceylon, has also many local advantages, that render it extremely salubrious to Europeans, and consequently a convenient and easy retreat from the opposite burning coast.

The Cape of Good Hope, however well adapted to the refreshment of a crew, after a long voyage, by its abundant supplies of animal and vegetable food, is by

* The *palma coccifera*, or coco-nut tree, whose milk is equally delicious and salutary, flourishes here in the greatest perfection, and may vie with the falernian juice in every good quality, without any intoxicating effect.

no means calculated, in regard to climate, for the recovery of hepatic or dysenteric individuals, returning from the East. The daily atmospherical vicissitudes, at this celebrated promontory, are very great indeed, [25 or 30 degrees] and consequently injurious where the bowels are at all affected. I shall only mention one instance corroborative of this assertion.

His majesty's ship Albion, on her late return from India, having touched at the Cape, sent a number of her people to the hospital, afflicted with chronic bowel and liver complaints. By the time of her departure for England, however, several of these had died, and all the others returned in a worse state than when they went on shore. This fact is worth attending to; and deserves to be kept in mind by the valetudinarian.

The climate of St. Helena approximates more to that of Europe, than the climate of any other intertropical situation. A rock, only twenty-seven miles in circumference, surrounded by an immense equatorial ocean, above the level of which it projects 3000 feet; whose summit is covered with perpetual verdure, and cooled by perennial breezes, must enjoy a serenity of air, and evenness of temperature, far beyond any part either of the Indies or Europe. The medium height of the thermometer is 64° , and atmospherical vicissitudes by no means great or sudden. At Plantation-House, the mercury, does not rise higher than 72° in summer, nor fall lower than 55° in winter. A temporary stay at this island would probably be attended with a salutary seasoning, preparatory to exposing the debilitated frame to the

rude inclemencies and transitions of northern regions. The scenery, too, of the *interior*, is as beautifully romantic, as that of the *exterior* is stupendously dreary and barren. The society, however, is confined; and forms a striking contrast with the social ease and unbounded hospitality of the East. But alas! it is a melancholy truth, that in the complaint I have been describing, a surprising mental despondency, or propensity to brood over misfortunes, pursues us through every climate!—

Scandit æratas vitiosa naves
Cura!—Quid terras alio calentes
Sole mutamus?—*Atrabiliosus*
Se raro fugit!

Sympathetic connexion between the mental and hepatic Functions.

The manner in which this mental depression becomes connected with derangement in the hepatic function, is a subject of curious inquiry. It is not a little singular, that two of the most important organs in the human body—the lungs and the liver, when in a disordered state, should exhibit a striking contrast in their effects on the mind. Thus, even in the last stage of phthisis—

“Hope springs eternal in the *hectic* breast;” and the final catastrophe stands a long time revealed to every eye but that of the patient.

In hepatic diseases, on the other hand, like Shakespeare’s cowards, we “die many times before our death.” It is a curious fact, that syphilis, a disease which can

only be cured by that medicine, on which we place our principal dependence in Hepatitis, is likewise attended with a similar despondency, but in a much less degree. There certainly is a greater connexion, or reciprocal influence, between the mental and hepatic functions, than is generally known or suspected. Experience has shewn, that both *excess* and *deficiency* in the biliary secretion affect the mental functions, though in a somewhat different manner. The former seems to exert its influence in two ways, viz. by its irritation in the primæ viæ, and by its absorption into the circulating system. That vitiated bile irritates the stomach and bowels, is admitted by all; and that part of it is occasionally absorbed, or regurgitates into the circulation, is equally evident, from the appearance of the eyes and countenance. The mental effects in both these cases are characterized by irritability, and what is properly called a choleric disposition; often, however, accompanied by the deepest dejection of spirits, amounting almost to despair, where no other adequate cause exists.

On the other hand, the defective secretion of bile seems to operate on body and mind in three ways, viz. By the insipid quality of the bile—by its absorption—and, simply, by its paucity: the mental effects characterized in such cases by melancholy or despondency. The insipidity of the bile in those diseases where the secretion is lessened, as in hypochondriasis, chlorosis, &c. has been noticed by Dr. Saunders and others. The consequence of this will be a torpor throughout the system at large, hence costiveness, imperfect digestion,

chylication, sanguification, &c. ensue; the influence of which on the mind is obvious.

The bile, however, is not always insipid in quality, where it is deficient in quantity. In those cases where it proceeds from structural alteration of the liver, or succeeds violent diseases of that organ, the bile is occasionally as vitiated and acrid, as where excessive secretion is going on. This takes place especially when those causes are applied which formerly produced great excitement in the extreme vessels of the vena portarum; as, high temperature—exercise in the sun—debauches; violent gusts of passion, &c.

In hot climates, indeed, I have thought that an inflammatory state of the liver was sometimes induced, or at least increased, by the acrimony of its own secretions. It has frequently been remarked by others and felt by myself, that after brisk doses of calomel and cathartic extract, the bilious evacuations have produced a sensation, as if boiling lead were passing through the intestines. The freedom of spirits, or sensorial energy, that succeeds, can only be appreciated by those who have experienced such disgorgements of vitiated bile! Every one has observed how diseased secretions, from the internal surface of the urethra, occasionally inflame and ulcerate the preputium and glans penis, if the greatest care be not taken to defend them by cleanliness: can we doubt that something of the same nature may take place in the intestines, and even in the ducts of the liver itself, where the biliary secretion is extremely depraved and acrimonious? The *remora*

alone of viscid bile in the pori biliarii and excretary ducts of the liver, may often occasion such obstruction in its languid circulation as shall give rise to inflammatory congestion in the organ. As I have shewn, therefore, that with irregular and diminished secretion, there is always a degree of vitiation, absorption, and irritation, I beg leave to designate their united effect on body and mind, by the term "*Morbid biliary irritation, or influence.*"

I conceive that this is quite equal to the task of originating those mental maladies, which in their turn *re-act* on the liver, stomach and intestines, disturbing their functions still farther, or increasing their torpor, as well as that of the whole system, by sympathy; producing, at length, the extensive catalogue of dyspeptic, hypochondriacal, and perhaps hysterical complaints!

Is it not this "non-secreted bile"** which gives that peculiar sallow complexion to Europeans long resident in hot climates, so distinguishable from a jaundiced suffusion of absorbed or regurgitated bile; and which is probably the first shade that Nature effects, in bending the colour to the climate? Europeans do not begin to assume this *sallow* tint, till the period of superabundant secretion is long past, and till atony and diminished action in the hepatic system have commenced. Indeed it is very possible, that what at first produced such commotion and inconvenience in the animal economy, would, in the course of a few generations, effect those

* By "non-secreted bile," I mean the elements from whence bile is formed.

corporeal changes in the exterior, which ultimately counteract, in a considerable degree, the baleful influence of the climate itself. To be more explicit. The derangement in the hepatic functions, originating, indeed, through sympathy with the skin, affects in its turn the tincture of that skin, by means of absorbed and non-secreted bile; and these yellow and sallow tints, acted on by the rays of a tropical sun, gradually verge, in the course of generations, to a sable hue. This change of colour, and, in some degree, of texture also [for the rete mucosum is *thicker* in Indians than in Europeans] renders the exterior of man less sensible to atmospherical heat; in consequence of which, a more mild and uniform action in the perspiratory vessels succeeds, and by sympathy, a correspondent equilibrium in the secreting vessels of the liver. Thus the skin, which was the first cause of disordered secretion in the liver, becomes ultimately the grand protection of that organ, and the derangement itself, in process of time, creates its own antidote! This is quite conformable to the known wisdom of Providence, and to the unceasing exertions of Nature, in remedying what she cannot entirely prevent.

This is a different doctrine from that of Dr. Smith: he attributes the black colour of Indians to the superabundant secretion of bile, and its suffusion on the surface; but that will not stand the test of examination. He does not take *diminished secretion*, or the elements of bile, into the account; nor does he trace any connexion between the hepatic and cutaneous functions.

May not the disposition to ulcers in hot climates, and among drunken sailors in our own climate, be accounted for by this *cutaneo-hepatic sympathy*? In the first case, the *cutaneous* vessels are debilitated by the heat, and the *hepatic* by sympathy. In the second case, the vessels of the stomach and liver, are debilitated by *drink*, and the *cutaneous* vessels by sympathy.

The effects of intemperance in spirituous liquors, on the liver and its functions, are not only known to every Tyro in the profession, but are proverbial in the mouths of drunkards themselves; little, therefore, need be said on this subject. But that the “depressing passions” should produce certain derangements in the hepatic functions, which, re-acting on the mind, give rise to, or aggravate the whole proteian host of hypochondriacal, hysterical, and nervous disorders, is by no means generally admitted; though the doctrine will probably gain ground.

The first effect of these depressing passions in the female sex is felt in the organs concerned in digestion—atony in the stomach—torpor in the liver and intestines. The aliment passes into the duodenum imperfectly digested—it there meets a scanty supply of ill-conditioned or insipid bile, and pancreatic juice. Under these circumstances, the progress of the chyme through the convolutions of the intestines must be slow, and the chyle imperfectly eliminated. Fecal accumulations take place; and probably the fermentative process goes on, for want of bile, with an extrication of air, which gives rise to distressing colic and borborygmi. To pro-

cure relief from these, the spirituous tincture and cordial have often been the harbingers of more dangerous indulgencies, and increased the malady which they were intended to alleviate !

By a careful course of cathartics, the bowels are cleared of that load of fecal and other matter, with which they were oppressed. Healthy bile is thus solicited into the intestines, instead of having its elements floating in the circulation. This natural stimulus promotes chylification ; which, strengthening the whole material fabric, communicates energy to the mind, till at length, the bloom of health once more revisits the shallow cheek of despondency.

But the lords of the creation are not exempted from the wide-spreading effects of hepatic derangements. From our large manufacturing towns, the foci of sedentary habits, intemperance, and the depressing passions, its influence may be traced through every ramification of society. One or two examples will suffice. The whole of the literary world, from the poet in his garret to the learned president in his hall, feel more or less of its effects. This deficiency in the secretion of bile, the consequence of mental exertion and corporeal inactivity, is evidently the “*morbus eruditorum*,” which

“ Sicklies o'er, with the pale cast of thought,”

the countenances of the studious, who waste their hours and their health by the midnight lamp ! To them I need not describe the malady; they are too familiar with its various symptoms. But few of them are

aware, how far material causes can influence intellectual ideas. If I wish to exert, on any particular occasion, the whole force of my memory, imagination, perception, and judgment, I know, from repeated experience, that by previously emulging the liver and its ducts, and carrying off all bilious colluvies from the alimentary canal, by mercurial purgatives, which also excite a brisker secretion in the chylo-poetic viscera, I am thereby enabled to avail myself of those faculties above-mentioned, to an infinitely greater extent than I otherwise could. This is no theoretical speculation: it is a practical fact. It may help to explain the great inequality which we often observe in the brightest effusions of fancy; and shew us, why even the immortal Homer sometimes nods.

On the Nitro-Muriatic acid Bath in Bilious Diseases:

This remedy is now coming so much into use, and affords so decisive a proof of the *Cutaneo-hepatic sympathy*, which I some years ago traced in the production and cure of bilious disorders, that I was naturally anxious to give it a trial in a class of diseases which I have long studied with more than usual attention. I have already seen sufficient, to be convinced that the *Nitro-muriatic acid bath* is a valuable remedy, when aided by proper medicines internally; and I can corroborate the greater number of Dr. Scott's statements relative to its effects on the human frame. From his

different papers on the subject, and my own personal observation, the following concise code of instructions is drawn.

§ 1—*Composition and mode of administration.* Dr. Scott appears to have wavered much in the composition of the bath. In a paper privately circulated among his friends, dated November, 1816, he observes—"I propose *in future*, to employ three parts of the muriatic to two of the nitric acid—this is the most powerful proportion I have yet discovered;" yet, in a paper dated nearly six months afterwards, and published in the Medico-chirurgical Transactions, he states that his bath is formed of "equal parts of the nitric acid and muriatic acid." His directions for the formation or strength of the bath too, are so very vague as to have deterred many practitioners from adopting his plans. The following will be found a more simple and determinate mode of proceeding.

Into a glass vessel, capable of holding a pint or more of fluid, put eight ounces of water, and then pour in four ounces of the nitric acid of the London pharmacopeia, and four ounces of muriatic acid, or the spirit of salt of the shops. This mixture may be labelled the "*Nitro-muriatic Solution,*" and one ounce to a gallon of warm water will form a bath of medium strength, and such as Mr. Astley Cooper commonly prescribes. The proportion may be increased to one ounce and a half, or diminished to half an ounce of the solution to the gallon of water, according to the age, strength, delicacy or other peculiarity of the patient. A bath of

two gallons is generally sufficient for the feet and legs. A narrow and deep wooden bucket is the best—such as will bring the water well up to the knees, without requiring more than eight or ten quarts of liquid. The feet and legs of the patient ought to be immersed in this bath, at a comfortably warm temperature—say 96°—and kept there twenty minutes or half an hour, just before going to bed. This may be done every night, or every second night, and the same bath will remain good for five or six nights. It ought to be kept in the wooden bucket, and a fourth part, or so, warmed up, every time it is used, in a well glazed earthen vessel, and added to the rest, which will make the whole of a sufficiently warm temperature.—Or a fourth part of the bath may be throw away, and a fourth part of fresh hot water added, with half an ounce of the *Nitro-muriatic solution*, whieh will obviate the possibility of any decomposition taking place by glazed vessels. But I have not observed any inconvenienee from warming up a part of the same bath, in the above-mentioned manner. Dr. Seott thinks that sponging the skin with the bath is equally as good as immersion; and that whe-ther cold or hot, the effects would be the same. In this last I am very far from agreeing with him, and give a deeided preference to the *warm* foot bath, or *warm* sponging, for very many reasons whieh need not now be explained. The strength of the bath must be regulated by the degree of irritability of the patient's skin. It ought, in general, to cause a priekling sensation, when the immersion has continued a quarter or half an hour.

The patients usually observe that their feet and legs continue warm, and even in a perspirable state the whole night afterwards.

§ 2.—*Effects of the Nitro-muriatic Acid Bath.* When carried to a considerable extent, so as to bring the system under its influence, it occasionally induces faintness, and a degree of nervous irritation or restlessness, with sometimes a coppery taste in the month, and an increased discharge of saliva, but without the mercurial foetor of the breath.—These effects are very fugitive, and very uncertain. I have known it produce a general itching all over the body; and in some cases, a considerable degree of pain in the soles of the feet.

“The nitro-muriatic acid bath,” says Dr. Scott, “appears; in a particular manner, to affect the glands, and to alter their secretions ; and on this power a great part of its value, in derangements of the liver, seems to depend.—‘ *It sometimes very suddenly increases the secretion of bile ; and this effect may be kept up for a length of time. It increases the perspiration, and often to a great extent.*’ The almost instantaneous effects that it produces on some people, and its suddenly causing a flow of bile, are all unlike a remedy that is conveyed by the known channels of absorption. I can suppose that the effects of this remedy do not arise from the transfer of matter by any set of vessels ; but that they are the consequence of peculiar motions, which it has the power of exciting in the solids, or the fluids of the body.’” Now I appeal to the professional reader whether the above be not a complete admission, in round-about terms, of the

cutaneo-hepatic sympathy, which I took such pains to elucidate; and as my work on Tropical Climates could hardly be unknown to the author of the above passages, I must say that Dr. Scott has hardly acted with professional candour or liberality in withholding all allusion to that part of my Essay, in which his opinions are corroborated, if not anticipated. On this account, I deem it incumbent on me to show that *others* have not overlooked the doctrine in question, if he has. In a few months after the publication of my work on Tropical Climates, the following passage appeared in a periodical Journal, from the pen of Dr. Perkins of Coventry, now a resident physician in Brussels. "One recent writer has been duly sensible of this fact; and his doctrine of *cutaneo-hepatic sympathy* will produce more beneficial revolutions in physic than have ever been effected by the Stahlian dreams, the inert phantasies of Hofmanic spasm, or the brilliant but delusive dogmas and dangerous hypotheses of John Brown." - *New Med. and Phys. Journal*, April 1814, p. 307.

In an excellent Latin thesis on Dysentery, by Dr. Archibald Robertson, written long before I had the honour of his acquaintance, the following passage occurs:— "Omnibus sane erit voluptati librum totum sed presertim observationes novas de consensu inter cutem et surculos venae Portae et nexus inter sudorem et secretionem, fellis, sedulo perlegere." p. 21. Finally, I cannot be insensible to the opinion of such a man as Dr. Armstrong who, in page 171 of his Essay on Typhus, thus expresses himself:—"The medical public, I conceive,

is very much indebted to Mr. James Johnson, for having so clearly illustrated the connection between dysentery and deranged functions of the *skin and liver.*"

I am not, however, anxious to claim a discovery, but to propagate a truth. And as the attention of the medical world is now strongly directed to the subject, there can be little doubt of its receiving a proper investigation.

§ 3.—*Disorders to which the Bath is applicable.* Dr. Scott properly observes that there is a very large class of diseases in this country, denominated **BILIOUS**, which arise from deficient, superabundant, and depraved secretions of bile; hence spring derangements of the stomach, giddiness, feverish heat—head-aches—restlessness at night—cramps and spasms—melancholy, and many of those unhappy feelings to which the term "*Nervous*" has been applied. "In such cases [says Dr. Scott, in a paper privately circulated] let the patient sit in the tepid *Nitro-muriatic acid bath* for the legs, half an hour or less, according to circumstances, every night, or every second night. With some of these biliously disposed people, the first bath, and that in a few hours, produces decided effects. It purges—gives rise to the expulsion of dark-coloured feces or bright-coloured bile; or bile of a brown, a green or black colour, like tar mixed with oil. The pulse, in time, becomes quicker than natural, and a degree of restlessness takes place. These effects may be kept up for a number of days. They are often, however, much longer in appearing. Where the bile is deficient in quantity,

the effects of the bath are only known by the feces returning, by degrees, to their natural colour, and by a gradual improvement of the health. With people disposed to bile, it is necessary to keep the bowels very open during the use of the bath; for one of its effects, as I have said, and on which much of its beneficial tendency depends, *is to produce a flow of bile* into the intestinal canal, the consequence of which should be obviated by laxatives. Those inconvenient effects of the bath arise from the very powers which enable it to correct more depraved conditions of the stomach and biliary organs. Although this bath, with little disturbance, produces many happy effects, let it not be supposed that delicate, or even strong people suffer no temporary inconvenience. Let it always, on the contrary, be recollected that the advantages produced by it can never be fully appreciated until the patient has given up the use of it for a considerable time. Even those who feel no very sensible effects from it at the moment, generally in the end find their health improved.

"The great remedy at present for bile, is calomel, or mercury in some form; but this it is necessary, after a time to repeat. The very same thing is true of the bath. When the bilious feelings return, it must be repeated. Patients must themselves discover how long they can go without its use, and when they return to it, two or three batheings of the legs, or washing the hands and arms for a few minutes with the *Nitro-muriatic bath*, or sponging the body more largely, will generally be found to bring relief. The periods of

health gradually become longer and longer, till a complete recovery of it is effected."

As sponging the body with the N. M. water has nearly the same effects as the foot-bath, a small quantity may, at any time, be easily prepared by adding one drachm of the "*Nitro-muriatic solution*" to each pint of warm water, in a common wash-hand basin. By means of a large sponge, the thighs, legs, stomach, chest, or arms may be wetted with this mixture for ten or fifteen minutes daily. Or the above-mentioned parts may be sponged alternately. With delicate people, or those who are very sensible to this remedy, it is often sufficient to immerse one hand, or wet one arm in the bath for a few minutes. Washing both hands, or hands and arms daily, will frequently be quite sufficient for delicate bilious patients.

This remedy bids fair to produce important effects in a certain class of infantile diseases where the liver and bowels are deranged, which indeed is more commonly the case than is imagined. My friend Mr. Webster, Surgeon of the 51st Regiment, has witnessed the most decided salutary effects of the bath in his own child afflicted with jaundice. The great effusion of bile into the intestines, which almost immediately supervened on the employment of the bath, afforded a fine specimen of the *cutaneo-hepatic sympathy* in question.—Indeed the beneficial effects which result from the *common warm bath* in the diseases of children, are most striking, and as these effects are greatly increased by the addi-

tion of the *Nitro-muriatic acid*, we may fairly anticipate the most important advantages from this measure.

But, as will be plainly observable from the preceding remarks, the necessity of watching the functions of the various viscera, during the use of the bath, will be sufficiently obvious; and the judicious administration of appropriate medicines, while the patient is under its influence, must infinitely enhance its powers, and hasten the recovery of the patient.

DYSENTERY.

SEC. X.—The disease in question is certainly one of great importance to be acquainted with, in the practice of fleets and armies. No other complaint—not even excepting fever, so much puzzles the young beginner; and for this plain reason, that in the hour of danger, both books and men distract his judgment, and paralyse his arm, by their diametrically opposite directions! Let any one, after reading Dr. Harty's volume on Dysentery, which gives a fair compendium of the principal modern opinions and practices in that disorder, be taken to the bedside of a patient, and he will be utterly unable to decide, in his own mind, upon the mode of treatment most eligible to adopt!

From this state of anxiety, is he relieved by applying for advice to men? By no means. One inspector tells him, he must consider dysentery as closely allied to en-

teritis, and depend principally on *venesection*.* Another comes round, and says, strictures in the colon, or small intestines, are the cause of dysentery, occasioning a retention of the fecal and other "*peccant matter*;" therefore he must purge. A third assures him, he will purge his patient to death, and that nothing but *sudorifics* can effect a cure. A fourth informs him, that *mercury* is a specific, and unless he raises a ptyalism, he will bury his patient. In this state of suspense, he vacillates from one direction to another, and his success is less, than if he pertinaciously adhered to the worst plan proposed.

It is true that experience will, *in general*, determine his choice; but many an anxious hour will he spend, in exploring his way through this labyrinth of opinions, and many a blunder will he commit in the mean time!

As there is hardly a disease in the whole range of nosology, more uniform in its nature and symptoms, than dysentery, this discrepancy among authors and practitioners must have originated, I conceive, in consequence of mistaking prominent *effects* for proximate *causes*; and as the means of cure directed against the former have often removed the latter, each individual believed that he alone had found out the true cause and cure of the disease. Thus, one physician examining the body of a patient who died in a certain stage of dysentery, and finding many traces of inflammation, or even sphacelus, in different parts of the intestines, without any strictures, frames his inflammatory hypothesis ; and al-

* Vide Dr. Wright on the Walcheren fever; also Dr. Somers on extreme bleeding in dysentery of the Peninsula.

though he employs, as *auxiliaries*, some of the means recommended by others, he makes venesection the *principal* indication—has tolerable success, and becomes quite satisfied that he has hit on the proper plan. Another patient dies at a less advanced period of the disease, or where mortification had not relaxed, and effaced all signs of stricture. He is examined by a different physician, who finds the inner coat of certain parts of the intestines corrugated, thickened, and the canal reduced to a very small diameter, with scybala, or rather fecal accumulations [for those who talk about scybala, have not, I fear, examined the abdomens of many dysenterics,] lurking in the cells of the colon, or flexures of the small intestines, situated above these strictures. Establishing a doctrine on this, bleeding is only had recourse to occasionally; and certain medicines, supposed to have the power of relaxing these spasms or strictures, are exhibited, with frequent laxatives, and success is often the result.

A third person, in examining the bodies of dysenteric patients after death, in hot climates, finds abscess, or other organic derangement of the liver, an appearance very common; and concludes that Dysentery is Hepatitis in disguise. He prescribes mercury, and his success is still greater than that of others; consequently he is positive that he alone pursues the true course, and entertains just ideas of the disease.

A fourth, observing that dysentery is always accompanied with defective perspiration, and taking up the idea of Sydenham, that it is a fever turned in on the

intestines, has recourse to sudorifics, to turn it out again, and not without considerable success; so that he pities the blindness of those who cannot see that the disease is merely "the perspiration thrown on the bowels."

—How are we to reconcile these jarring opinions and practices? In adhering obstinately to any one of these plans we will be often right; but assuredly we will be not seldom wrong. On the other hand, by giving a discretionary power to adopt one or other of them, as symptoms may indicate, we confer a licence on the young beginner, for which he probably will not thank us in the hour of trial or responsibility. He who could lay down one fixed principle, which is uniformly to be kept in view, through every case and every climate,—a principle that would explain the phenomena and the cure; who could give *plain and easy directions* when and where we are to lean towards one or other of the apparently opposite modes of treatment, without ever losing sight of the principle in question, or, for a moment, relaxing in the pursuit of that salutary object which this principle points to, would certainly deserve the thanks of the junior branches, at least, of the profession.

I have hinted what I supposed to be the origin of these clashing theories and practices; to wit, the mistaking effects for causes. Thus, if we do find stricture in any part of the intestinal canal, what produced it? This must evidently be the effect of some cause. If we find inflammation there, it is proved to be a consequence, and not a cause of dysentery, from this plain fact, that in original and unequivocal inflammation of

the bowels, or enteritis, constipation is almost always present. In hot climates, if we find dysentery, or [as some will not allow it that name] flux, a pretty constant attendant on Hepatitis, particularly the languid or chronic species of it, it does not follow that Hepatitis is a general concomitant, much less a cause of dysentery. In many cases of Hepatitis, especially when violent, there is obstinate costiveness; and in numerous fatal cases of dysentery, no structural derangement in the liver can be observed.

Those who have attributed it to suppressed perspiration, have come nearer to, but stopped far, very far short of the mark. The suppression of this discharge is, in itself, a trifling, though in its connexion with others, it becomes an important feature in the proximate cause of dysentery.

-As causes can only be traced by their effects, we must endeavour to find out, among the latter, such as are *always* present in dysentery, and have a decided *priority* in occurrence. These, I conceive, constitute what is meant by proximate cause in this, as well as in every other disease. Are there any such, then, in dysentery? I believe there are; and this belief does not rest on speculative grounds. I have not learnt the knowledge of this disease from the ancients nor the moderns, but studied it in the book of Nature; and every one of its symptoms has been deeply impressed on my memory, by painful personal experience, both within and without the tropics.

In every case of dysentery that has ever come within

the range of my observation, [and the number has not been inconsiderable] two functions were invariably disordered from the very onset, and soon drew other derangements in their train. These were, the functions of the skin and of the liver; or, perspiration and biliary secretion. I defy any one who has minutely regarded this disease at the bedside, to produce a single instance in which these functions were carried on in a natural manner, at any period of the disease. The partial clammy sweats which are sometimes seen on the surface, with the occasional admixture of bilious sordes in the stools, so far from being objections, are proofs of this position; for, excepting the above appearances, which are *unnatural*, the regular perspiration is suppressed, and the healthy secretion of bile entirely stopped. Dr. Balfour, who had some twenty years' experience in this complaint, and who treats of it under the name of "*putrid intestinal remitting fever*," states, at page 17 of his second Treatise on Sol-Lunar Influence, that—"At the *very beginning* of putrid intestinal fevers, and also about the time of their *final crisis*, or termination, I have often observed copious discharges of recent bile; but as the fever advanced, and remained at its height, such discharges have frequently *ceased to appear*; and I have been led to suspect, from these circumstances, that the passage of the bile into the duodenum, during this interval," [viz. from the very beginning to the crisis or termination] "*was altogether stopped*." I beg the reader will keep this in mind.

These, then, are the two first links of that morbid

chain which connects the remote cause with the ostensible form of the disease. Whoever can break these, by restoring those two functions to their natural state—I care not by what means or medicines—he will cure, or rather prevent, the disorder.—But we can seldom expect to be called in at this early period, for Dysentery is not yet manifested, although an accurate observer might, in his own frame, often detect these nascent movements, and, by prompt measures, extinguish the disease *in embryo*.

Some other invisible, at least, very obscure links, are now to be noticed:—for however confidently a *proximate cause* may be decided on in colleges and closets, it is, in nature, a series of causes. The equilibrium of the circulation and excitability becomes disturbed. In consequence of the torpor in the extreme vessels on the surface, the volume of blood is directed to the interior, and the balance is still farther broken by the check which the portal current meets in the liver, from a corresponding torpor in the extreme or secreting vessels of that organ; the effect of which is, that the plethora in the cœliac and mesenteric circles is now greatly augmented, and febrile symptoms commence. The perspiration being stopped, a vicarious discharge of mucus and acrid serum is thrown from the extremities of the turgid mesenteric vessels upon the internal surface of the intestines, which by this time are in a state of irritability.* The disease now begins to exhibit itself une-

* It may be observed that the same phenomena take place in most tropical fevers, and also in severe cases of cholera morbus, mort de chien, &c. This I grant; for the same

quivocally, by the uneasiness in the bowels, the frequent desire to stool, and the mucous discharges. We may now plainly perceive how all those consequences, which have so often passed for causes, can arise. If the plethora be great, blood itself will be poured out from the mouths of the distended mesenteric and meseraic vessels; hence inflammation and ulceration may ensue. If any hardened feces lurk in the cells of the colon, they will be grasped by the irritable circular fibres of the intestines, and rings or strictures will augment the tor-
mina and griping in the bowels.

In this situation, nature evidently attempts to restore, by re-action, the balance of the circulation and excitability with the cuticular and hepatic functions, but she rarely succeeds; her abortive efforts too often aggravating, instead of relieving the symptoms. Thus we sometimes see a partial, ill-conditioned sweat on the surface, which is productive of no benefit; while from the liver, an occasional gush of vitiated bile, like so much boiling lead, throws the irritable intestines into painful contortions, and then the tormina and tenesmus are insufferable! Nature, to say the truth, is but a sorry physician in Dysentery. "In hoc enim corporis affec-
tu," says Sir G. Baker, "aliquid certe in medicina opus est, haud multum in *Naturæ* beneficio." Where

causes that, applied to one person, produce bilious fever, will in a second give rise to hepatitis—in a third to mort de chien—and in a fourth to dysentery, according to the organ that happens to be most predisposed to disease. Nay, a combination of all these diseases will often be found in the same case.

she ultimately gains her end, it is where the local plethora is reduced by the discharge from the mesenteric and meseraic vessels, without occasioning much organic derangement in the bowels. This being effected, she more easily restores the equilibrium of the circulation and excitability and the functions above mentioned. But, in a great majority of cases, where the disease is violent her exertions either hasten the fatal catastrophe, or produce such lesion of structure and function in the chylopoetic viscera, as induces a tedious chronic state of the complaint, very difficult to manage.

The febrile symptoms will, at first, be in proportion to the *general* disturbance in the balance of the circulation and excitability; they will afterwards be kept up, or modified, by the extent of the organic derangement sustained. The discharge of blood by stool, on the other hand, appears to be proportionate to the *local* plethora in the portal and mesenteric circles, and to the permanence and degree of torpor in the liver, occasioning that plethora.

This doctrine, thus, briefly sketched out, if impartially considered, and fairly applied, will, I think, clearly account for every phenomenon of the disease, from the derangement of the liver, the largest of all glands, to that of the mesenteric glands themselves, which have, in their turn, been considered as the seat, or even the cause of dysentery.

But it is not sufficient that it merely accounts for the phenomena. If founded in nature and truth, it should, like an arithmetical rule, prove itself in various ways.

Above all, the practical application of it ought to involve no contradictions; however various the routes may appear, they must all be shewn to tend ultimately to one point—the cure. It should explain how different means have attained the same end; and, finally, it should chalk out the best and nearest path we are to pursue. To this task I consider the doctrine in question perfectly equal; though I shall not apply it farther than to the leading phenomena of the disease, and the principal methods of cure.

Of the former I have spoken; I now come to the latter. The practitioner who has set down an inflammatory state of the intestines as the cause of dysentery, comes, to a patient, who is very ill with violent tormina and tenesmus; and passing blood, in alarming quantities, with his stools, which consist of nothing but that and mucus. He bleeds copiously, as his principal indication, and prescribes laxatives or sudorifics as minor means, and in a trifling way, as auxiliaries. He soon finds that the flow of blood by stool is much reduced—that the tormina are mitigated, and that something more than mere mucus comes away after the laxatives, with considerable relief to the patient. Nothing can be more plain than the way in which these means are beneficial, on the principle in question. Venesection lessens at once the plethora in the mesenteric vessels, and checks the effusion from their mouths. A general relaxation throughout the whole system follows—intestinal strictures are relaxed—scybala and fecal accumulations pass off; and Nature, thus relieved, attempts a

restoration of equilibrium in the circulation and excitability, evinced by some degree of action in the extreme vessels on the surface, and, by sympathy, of the secreting vessels in the liver.

So far the physician has greatly assisted the spontaneous efforts of the constitution; and if the latter be equal to the task of keeping things in this prosperous train, all will be well—if not, the morbid state returns, and with it a fearful debility, which paralyses his arm, and embarrasses his mind! His patient may or may not recover; but I should not like to be in his situation, under a man who confines his principal aim to the obviating of inflammation.*

He who confides in purgatives, [and a great many do, who know little of the complaint] from an idea, that stricture and a retention of the natural feces are the essence of dysentery, treads on exceedingly tender ground. He certainly does assist Nature in her most ostensible, but dangerous method of cure. If, by a course of purgatives, he can lessen the local plethora, and excite the healthy action of the liver [both which objects evacuating medicines, particularly of the mercurial kind, are without doubt calculated to effect] be-

* Since the first edition of this work was printed, Dr. Somers has drawn the attention of the medical world to *extreme* venesection in dysentery as it appeared on the Peninsula. But I believe that experience, in tropical climates at least, will only assign venesection its proper rank as a powerful *auxiliary* in the treatment of this formidable disease. Dr. Somers has not the honor of originality here. Dr. White used the same *venesectio ad d liquum*, in Egypt, in 1892.

fore any material injury takes place in the intestinal canal, he will succeed; because the general balance of the circulation will soon be restored, when the portal and mesenteric plethora is removed; and the sympathising function of the skin will participate in the healthy action of the liver. But in a large proportion of cases, he will have the mortification to find, that such organic derangements occur, before he can attain his object, as will either hasten the fatal termination, or prove a fruitful source of misery in the chronic stage of the disease, which too often ensues.

The rationale of the emetic and sudorific plans, on the principle in view, is sufficiently obvious. They not only determine generally to the surface, but, by exciting the healthy action of the liver, they locally relieve the meseraic and mesenteric plethora [a circumstance which their employers did not calculate on,] and thus restore the balance of the circulation with the functions of perspiration and biliary secretion.

But however beautiful this plan may be in theory—however successful it may be in a few sporadic cases of dysentery in private life, or in a well-regulated hospital, a more *utopian* practice for fleets or armies, in a tropical climate, was never seriously recommended for general adoption. Much do I suspect that those who praise or propose it, have never put it to the test of experience, except on a very confined scale, and with every convenience at hand. “There would be this inconvenience,” says the judicious Dr. Blane, “in constantly encouraging a sweat, that if the tenesmus should

return, it [perspiration] would either be *checked* by the patient getting frequently out of bed, or there would be danger of his catching cold."—*3d ed. p. 457.*

The mercurial plan is of a very different stamp, in regard to its applicability. Indeed, the *empirical* exhibition of mercury, as it is called, in hepatic and dysenteric complaints abroad, has quite shocked the feelings of some physicians at home. But the army or navy surgeon, who has a vast number of dysenteric patients coming every day under his care, smiles at these delicate scruples. He knows, by repeated observation, that if he can bring on free ptyalism, the patient is secure for that time; and this begets a strong bias in favour, either of the *specific* power of mercury, or of the liver being the primary seat of the disease. With these prepossessions, he drives on for the object in view, regardless of particular symptoms and disdaining to call in the aid of those means which I have been describing, and which are considered by others as the principal remedies. He is generally, however, successful; and if he knew to what extent he might go with safety in this empirical manner, he would be still more so, as shall be shewn in due time. But occasionally he is foiled, and cannot raise a ptyalism—then his resources are gone! The patient wastes away—¹inflammation, ulceration—even gangrene, may supervene; or, some morning, he sees, with astonishment, several inches of the rectum, that have passed off by stool in the night! This has happened under my own care, and *I know* that the same has occurred to several others.

Thus we see, that any one of the above methods, when set up as a principal to the exclusion of others, is attended with inconvenience, and [excepting perhaps the last] with repeated failures, if not general want of success, particularly in hot climates. A heterogeneous combination of them all, on the other hand, without order or discipline, and guided only by the discretion or caprice of the young practitioner, would be little better, if not worse, than a blind adherence to one. Nothing, in short, but a controlling principle, that is ever to be held in view, under whose superintendance the above-mentioned agents are to be employed in their proper spheres, can lead to a settled and rational practice in dysentery, or reconcile those jarring opinions and practices, with which both books and men continue to puzzle the minds of all those whom personal and wide experience has not emancipated from the trammels of authority.

I have declared the *principle* that is to govern us [the restoration of *healthy* perspiration and biliary secretion, with an equilibrium of the circulation and excitability] and enumerated, in a general way the means which we are to use;—the direct application of the whole to practice, will be illustrated presently by an appeal to facts.

I have purposely avoided, as much as possible, throughout this essay, to quote my own cases, in support of my own doctrines. The following short narrative, however, may be allowed a place here; and may not be uninteresting or uninstructive:—

A very few weeks after my first arrival in Bengal, I made one in a party of officers, who landed a few

miles below Kedgeree, for the purpose of shooting and of seeing the country. The day was excessively hot—the ground was half inundated, and we waded and rambled about, through marshes, jungles, and paddy-fields—often with one-half of our bodies under water, and the other broiling in the sun, till we were fairly exhausted. As we had a sumpter-basket with us, we spent the whole day in this manner; and on returning in the evening, to the banks of the Ganges, at a place appointed, we found that the boat could not approach the shore, the water was so shoaly; we therefore dashed into the river, and waded off to where the boat lay at a grapnel. By this time it was sunset, and as we had a strong tide against us, we sat in the boat nearly two hours, dripping wet, and shivering with cold, before we got on board. That night, my sleep was disturbed, and I felt slight rigors or chills, alternated with flushes of heat; but in the morning I got up as usual, and concluded that all was well. At dinner I had no appetite; and soon afterwards I felt uneasiness in my bowels. As the evening advanced I had frequent calls to stool, with griping, and some tenesmus, nothing coming away but mucus. Fever now came on—my skin became hot, dry, and parched,—and by 11 o'clock at night, I could scarcely leave the commode. The misery of that night will never be erased from my memory! I was often delirious, especially when I lay down in bed; but indeed so dreadful were the tortures and tenesmus—so incessant the calls to stool, that little respite could be procured. I had taken a dose of salts in the evening,

but they afforded very trifling relief, except by bringing off some feculencies, attended with a momentary lull. Early in the morning, a medical gentleman, belonging to an East-Indiaman, visited me, and found me in a very bad way. I was now passing blood fast, and the fever ran high. I was bled, and took an ounce of castor oil immediately; a few hours after which, six grains of calomel, and one of opium, were taken, and repeated every five hours afterwards, with occasional emollient injections.

The day passed rather easier than the preceding night—the torments were somewhat moderated by the medicine; but I had considerable fever—thirst—restlessness, and continual calls to stool; nothing, however, coming away, but mucus and blood. As night closed in, the exacerbation was great. The opium lulled me occasionally, but I was again delirious; and the phantoms that haunted my imagination were worse than all my corporeal sufferings, which were, in themselves, indescribably tormenting. The next day I was very weak; and so incessant were the griping and tenesmus, that I could hardly leave the commode. The tenesmus was what I could not bear with any degree of fortitude; and, to procure a momentary relief from this painful sensation, I was forced to sit frequently on warm water. The calomel and opium bolus was now taken every four hours, with the addition of mercurial frictions. An occasional lavement was exhibited, which gave much pain in the exhibition, and I each day took a dose of castor oil, which brought off a trifling fecu-

lence, with inconsiderable relief. My fever ran higher this day than yesterday, with hot, dry, constricted skin. As night approached, my debility, and apprehension of the usual exacerbation brought on an extreme degree of mental agitation. The surgeon endeavoured to cheer me with the hope of ptyalism, which, he assured me, would alleviate my sufferings—I had then no local experience in the complaint myself. As the night advanced, all the symptoms became aggravated, and I was convinced that a fatal termination must ensue, unless a speedy relief could be procured. I had no other hope but in ptyalism; for my medical friend held out no other prospect. I sent for my assistant, and desired him to give me a scruple of calomel, which I instantly swallowed, and found that it produced no additional uneasiness—on the contrary, I fancied it rather lulled the torments. But my sufferings were great—my debility was increasing rapidly, and I quite despaired of recovery! Indeed, I looked forward with impatience to a final release! At four o'clock in the morning, I repeated the dose of calomel, and at eight o'clock [or between 60 and 70 hours from the attack] I fell, for the first time, into a profound and refreshing sleep which lasted till near midnight, when I awoke. It was some minutes before I could bring myself to a perfect recollection of my situation prior to this repose; but I feared it was still a dream, for I felt no pain whatever! My skin was covered with a warm moisture, and I lay for some considerable time, without moving a voluntary muscle, doubtful whether my feelings and senses did not deceive

me. I now felt an uneasiness in my bowels, and a call to stool. Alas, thought I, my miseries are not yet over! I wrapped myself up, to prevent a chill, and was most agreeably surprised to find that, with little or no gripping, I passed a copious, feculent, bilious stool, succeeded by such agreeable sensations—acquisition of strength, and elevation of spirits, that I ejaculated aloud the most sincere and heartfelt tribute of gratitude to heaven for my deliverance ! On getting into bed, I perceived that my gums were much swollen, and that the saliva was flowing from my mouth. I took no more medicine, recovered rapidly, and enjoyed the best state of health for some time afterwards.

Mr. Curtis may denominate this disease, “bilious fever and flux,” or “Hepatic flux,” but as it answers to every part of Dr. Cullen’s definition, except the *erroneous* part, I must say, that it is a very fastidious multiplication of distinctions without any real difference.* The “nature of the discharge” has led Mr. Curtis, and many others, astray. Often have I been told by gentlemen that their patients were passing great quantities of bilious redundancies, when, upon examining the stools, four-fifths of these were composed of mucus, tinged of various hues, with vitiated bile and blood. It is astonishing how small a quantity of the former will communicate even a deep colour to any other fluid. Mr. Curtis’s practice, too, consisted almost entirely in purgatives; consequently, what with this and the pre-

† Vide Curtis on the Diseases of India.

viously disordered state of the liver and its function, we need not wonder that considerable quantities of depraved bilious secretions were brought off during the treatment. But these accidental varieties in the appearance of the discharge, arising from local causes, and greatly modified by the means employed for cure, do not authorise us to change the name of the disease. Such appearances have been observed in all countries, especially in autumnal seasons, and where purgatives formed a prominent feature in the *methodus medendi*. They have even led to the idea, that bile was the cause of dysentery.

Of the *remote* causes I need say little. They are the same in all parts of the world—atmospherical vicissitudes. Perspiration and biliary secretion being in excess during the intense heat of the day, are so much the more easily checked by the damp chills of the night, and the consequences which ensue are clearly deducible from the principal I have stated. In short, the same general causes produce bilious fever, hepatitis, and dysentery. They are three branches from the same stem, the organs *principally* affected occasioning the variety of aspect.

Dysentery, *ceteris paribus*, will be the most frequent form: first, on account of the injury which the intestines are in the habit of previously sustaining, from the irregular or disordered function of the liver, whereby they become weakened and irritable; secondly, because they are destined, by Nature, to sustain the vicarious afflux of suppressed perspiration. They are all cured on the

same principle, and with some slight variety, arising from local circumstances, by the same remedies—a strong proof of the connexion which I have traced.

We now see how a few years' residence in hot climates predisposes heedless soldiers and sailors to Dysentery, as remarked in the section on Yellow Fever, by the experienced author of that article, and as is well known to those who have practised between the tropics. The same principle explains the reason why we so frequently find Dysentery a concomitant on Hepatitis, especially that languid species of it, arising from obstruction and congestion, with previous derangement of function in the liver, rather than acute European inflammation. In the latter, as in enteritis, the bowels are, for the most part, costive. We next proceed to the cure, and various practical remarks connected with it.

There are two safe and comparatively effectual modes of curing Dysentery. I shall point out the principal remedy in each method first, and notice the subordinate auxiliary ones afterwards. One method is, to give mercury, in comparatively small doses, either alone, or combined with an anodyne, or with an anodyne and diaphoretic [which I prefer] in such a manner, that from 24 to 36 or 48 grains of calomel, according to the urgency of the symptoms, may be exhibited, in divided portions, at three, four, or six-hour intervals, during the course of the day and night. In the same space of time, from two to four grains of opium, and from ten to fifteen grains of antimonial powder or ipecacuan, may with advantage be administered, in combination with

the calomel. One or two doses, at least, should be given, before a laxative is prescribed; and an ounce of castor oil is the best medicine I can recommend for the latter purpose. It will often bring away hardened fecal, or vitiated bilious accumulations, when the irritability of the intestines is previously allayed by the calomel and opium; and it will, in that manner, soothe the tortina and tenesmus. But although it may be repeated every day, it is never to interrupt the progress of the main remedy.

When blood appears alarmingly in the stools, whether the fever run high or not, venesection may be employed without the smallest apprehension of that bugbear—**DEBILITY**.—Emollient oily glysters may also be occasionally thrown up, to lull the tenesmus; but as the rectum is generally in a very irritable state, glysters are often unmanageable remedies. A flannel shirt is to be put on, and a bandage of the same with a double or treble fold of flannel round the abdomen, which is to be rubbed, once or twice a-day, with a liniment, composed of mercurial ointment and tincture of opium, well incorporated. By a steady perseveranee in this simple plan, for a few days, the mouth will become sore, and every bad symptom vanish.

Thus, in less than a page, is stated a practicee, which being founded on principle, is generally applicable to almost every stage and degree of Dysentery, and contains within itself resources against most emergencies. While we proceed directly onward to our final object—the restoration of the cuticular and hepatic secretions, with

an equilibrium in the circulation and excitability, by a combination of mercury and diaphoretics, we lull pain, and relax strictures, at the same time, by the opium. To guard against inflammation of the intestines, we have the lancet on one side—and to carry off diseased, or irritating accumulations, we have laxatives on the other; the fever, being principally symptomatic, will, of course, cease with the cause. For the successful issue of this treatment, in general, I appeal to the rigid test of future experience with others, perfectly conscious, from my own, of its superior efficacy.

This was the usual method I pursued, and with results far exceeding my most sanguine expectations. In some cases, of more than common violence, I was occasionally led into a practice somewhat different, which will be noticed presently.

It is a little singular, that no two medical gentlemen on the station, agreed exactly in the mode of administering mercury—each was probably attached by habit to his own formula: but in one thing they were all unanimous—its astonishing power over the disease. This speaks for itself. I shall here exhibit a few specimens of the practice adopted by some of the most intelligent surgeons, and who had the longest and most extensive experience in the Eastern hemisphere.

Mr. Rowlands, surgeon of H. M. S. Tremendous, [now surgeon of Halifax hospital] when called to a dysenteric patient, prescribed, first of all, a dose of sulphate of magnesia or soda; immediately after the operation of which, one grain of calomel was given every half-hour, without

interruption, till ptyalism took place, which was generally on the third day. Scarce any other medicine was employed, except bladders of warm water to the abdomen, and the anodyne mercurial ointment, which I have already noticed.

Mr. Henry, surgeon of the Trident, a gentleman who passed a great number of years in India, and had ample experience, proceeded on the following plan: ten grains of calomel were given three times a-day, till ptyalism ensued; interposing occasional laxatives—generally castor oil, or salts; and in the more advanced stages of the disease, combining small doses of opium with the calomel.

Mr. Shields, of the Centurion, a very experienced surgeon, commenced with a dose of castor oil in mint water, and after it had taken effect, prescribed an anodyne antimonial draught in the evening. Mercury was then administered in the following formula:—calomel, a drachm, ipecacuanha, half a drachm, opium, gr. xii. These were made into twenty-four pills, two of which were taken three or four times a-day, according to the urgency of the symptoms, till salivation came on, with an occasional laxative of castor oil.

Mr. Scott, surgeon of the Caroline, a judicious practitioner, and who, like myself, had been—“severely taught to feel” the violence of this disease, as well as of Hepatitis, pursued the following method: A saline cathartic [magnes. sulphat. an ounce,] was first ordered, and, after its operation, an anodyne diaphoretic draught in the evening. From this time, mercury was

given as follows: calomel, a drachm, opii. gr. iv. saponis q. s. ft. pil. xx. One of these to be taken every two hours, till ptyalism ensued, interposing a laxative when griping was troublesome, and giving an anodyne draught every night.

It would be useless to multiply examples—the above are sufficient to give an idea of the general practice pursued in the East, and form so many living testimonies of its efficacy, of which not a shadow of doubt can be reasonably entertained.

I have now to notice a still bolder track which was followed by a few surgeons in that quarter, without the least communication of sentiments on the subject—each conceiving his own plan to be perfectly unique. I have mentioned that, in my own case, when despairing of recovery, I took, in one night, two scruple doses of calomel, without experiencing any increase of the tormina, or urgency to stool; but, on the contrary, with an apparent alleviation of those distressing symptoms. Although this circumstance did not make much impression on my mind at the time, as I considered it merely accidental; yet, when some of my patients afterwards appeared in similar situations, and I was in great anxiety about the event, I ventured to have recourse to the same measures, and never in any one instance, with injurious effects, but very generally with an amelioration of symptoms, and an acceleration of the object in view—ptyalism. Emboldened by this, I afterwards tried calomel in scruple doses, two, three, or even four times a day, without any other medicine whatever; and found

that it almost invariably eased the torments, and lessened the propensity to stool; and, upon the whole, brought on ptyalism sooner than any other plan of smaller and more frequent doses. In one or two instances, however, it produced great nausea and sickness of stomach, with spasmodic affections of different parts of the body, which were soon removed by an opiate, combined with a diaphoretic, to determine to the surface. I did not, indeed, adopt this practice generally, being quite satisfied, in ordinary circumstances, with the plan which I have above detailed. But whenever, in doubtful cases, I had occasion to push boldly on for ptyalism, I gave the calomel in scrupulous doses; which I found, by repeated experience, to sit easier than either a smaller or larger quantity of that medicine—a curious, but a certain fact.

I was surprised, long after this, to find that a German assistant-surgeon, who had charge of my patients for some time, while I was at sick quarters on shore, made it a very common practice to cure dysenteries in this way. But the following table will shew, that experience had pointed out the knowledge of this fact to others also.

Tabular View of Thirty Cases of genuine idiopathic Dysentery, treated with Calomel, in Scruple Doses, on board H. M. S. Sceptre, in the East Indies, by Mr. JOHN CUNNINGHAM, Surgeon of that ship. 1805.

Mens' Names.	No. of days under cure before the purging stopp'd.	No. of days on the list, before fit for duty.	Total num- ber of days afterwards, on the list.	Scruples of calomel, taken in scruple doses, twice or thrice a day.	Remarks.
Henry	3	10	13	Scr. VI	
Davis	4	3	7	X	
Kenan	4	3	7	V	
Jackson....	4	5	9	IV	
Humpheries	6	14	20	VIII	
Cradock ..	8	5	13	XII	
Paterson ..	2	3	5	IV	
Vinton ...	6	7	13	IX	
Connor ...	3	10	13	V	
Richardson	4	9	13	V	
Mabley ...	9	3	12	XII	
Smith	4	6	10	V	
Dixon	4	3	7	VI	
Noble	6	12	18	XIII	
Smith (2) .	3	11	14	VI	
Williams .	4	6	10	IV	
Murray ..	3	6	9	V	
Stendon ..	2	7	9	IV	
Palmer ...	4	7	11	VII	
Lum	3	11	14	V	
Salter	8	5	13	XVIII	
Stoner	5	3	8	IX	
M'Cormick	4	6	10	V	
Stoneham .	8	13	21	XV	
Kinch	2	5	7	IV	
Smith (3) .	4	16	20	IX	
Bell	2	3	5	III	
Whitehurst	4	18	17	X	
Kenan (re- lapsed) .	3	7	10	VI	
Wilmot ..	4	6	10	XII	

Average number of days before the disease was checked, 4. Average convalescence afterwards, 7. Average no. of days on the list, *in toto*, 11. Average no. of scruples of calomel taken, 73 by each man. Of 231 cases of dysentery, treated with calomel in different ways 6 died. Of the last 60, treated in the annexed manner, none died.

If this document, confirming what I have related before, does not remove every doubt or prejudice from the minds of European practitioners, they must be proof against the impressions of truth. It is accompanied by the following remarks :—

“I am perfectly convinced,” says Mr. Cunningham, “that this is the most successful method of speedily impregnating the system with mercury, because it does not excite the alvine discharge, so as to carry off the medicine by stool, as I have too often found smaller doses do.* As far as I could observe, larger doses than a scruple had the same effect as smaller, in aggravating the griping and purging. The whole amount, of my experience, then, in the treatment of more than 200 cases of genuine idiopathic dysentery, is this :—that calomel, administered in scruple doses twice or thrice a day, is an almost certain remedy for dysentery—in hot climates, at least. There is no occasion to continue its use longer than till the symptoms fairly give way. But in obstinate cases, the system must be well impregnated, before a permanent cure can be expected. When the griping or fixed pain in the bowels ceases after the administration of a few scruples, and especially if the ptyalism be appearing, although the stools may continue frequent, it will be prudent to omit the medicine for a period or two, to ascertain the consequence ; for it generally happens

* Mr. Cunningham had a great prejudice against opium in this complaint, which accounts for the remark on small doses of calomel. A small proportion of the former medicine will completely obviate this effect without any injury, especially if determined to the skin by diaphoretics.

that, under such circumstances, the purging also subsides, as the ptyalism rises, and entirely disappears with the cessation of the mercurial action, which ought always to be allowed to abate gradually of itself, without purgatives or diaphoretics, otherwise a disagreeable return of the purging may be the result.

"I ought to notice, that although dysentery prevailed in the Sceptre to a greater extent than in any ship of her class in India, during the time I belonged to her, yet not a single instance of hepatitis, supervening on the former disease, occurred. This was attributed by others, as well as by myself, to the liberal manner in which I prescribed mercury for the cure of dysentery, which I am convinced has some intimate connexion with hepatitis. In the Albion and Russel, where much less calomel was used, liver complaints were very prevalent. The foregoing table exhibits the quantity of calomel taken, and the time required for the cure of the last thirty cases of dysentery, without any selection, that came under my care." I may here add, that Mr. Cunningham, by way of experiment, took, when in perfect health, three scruple doses of calomel in one day; the only effect of which was an indescribably pleasant sensation along the line of the alimentary canal, with one natural stool in the evening. Mr. Ncill, of the Victor, was also in the habit of giving calomel in scruple doses, for the cure of dysentery and bilious fever, with great success, and without ever experiencing any inconvenience from the largeness of the quantity.

Since the first edition of this work appeared, numerous testimonies in favour of *scruple* doses of calomel in dysentery have been published by able practitioners. They unanimously confirm the effects which Mr. Cunningham and myself have described, and some ingenious naval surgeons are now in the habit of giving calomel in these doses for the cure of recent chancr, asserting that a more speedy and effectual stop is thus put to the syphilitic virus, than in any other mode of administration. Mr. Cunningham, lately surgeon of H. M. S. Rochefort, and assistant-surgeon Boyle, of the Royal Navy, have adopted this plan, in different parts of the world, and without any communication of ideas on the subject.

If it be still urged, that there is something peculiar in the nature of India fluxes, which renders them tractable under mercury, and that the same treatment will not succeed in the West, I happen to have before me a document, which will go far to settle that point. In the years 1809 and 1810, fever and dysentery prevailed to a great extent, on board H. M. S. Sceptre, in the West Indies. Mr. Neill was surgeon of the ship; and adopting the Eastern practice, with which he was well acquainted, his success was equal to his hopes or wishes. I shall quote his own words, and he is now in England to vouch for their correctness.

“Dysentery is certainly a disease of the utmost importance in this climate, (West Indies) and may perhaps be connected with other complaints, which we might

not have the most distant suspicion of.* Out of eighty well-marked cases, three have died. The first was an old man, who had two violent attacks previous to the last, or fatal one. The second was a very fine young man, who had scarcely ever been free from the complaint since we left England. The third died of the primary attack, which was accompanied with a much greater degree of fever than usual. In this *last* case, I deviated in some measure from my usual plan of cure, in consequence of calomel not standing high in the estimation of some medical gentlemen on this station. Confiding, therefore, more in the use of occasional purgatives and opiates, with diaphoretics, my patient died. From much experience in this disease, I may with confidence assert, that I scarcely remember to have lost a patient in primary attacks, or where the constitution was not cut down by climate and repeated attacks, when mercury [calomel] was given freely, so as to open the bowels, and bring on ptyalism." See also what is said by my friend Dr. Archib. Robertson on this subject, in the section on *Endemic of New Orleans*.

I have only to add, that since my return to Europe, I have never met with a case of dysentery, where I had the treatment, from the beginning, in my own hands, that did not give way to mercury and its auxiliaries before alluded to, and generally with more facility than between the tropics. In many cases of chronic dysentery, too, which I have met with among French prison-

* From conversations with him on this subject many years ago, in India, I know he alludes to the functions of the liver.

ers and others, the practice, with some slight modification, principally in the *quantity* of the chief remedy, has succeeded beyond my expectation, where the degree of emaciation, and the extent of local derangement, had rendered the prospect of a cure almost hopeless. A reference to numerous communications in the periodical journals of late, and particularly to the valuable work of Dr. Armstrong on Typhus, will shew how much the mercurial practice is preferred to others in dysentery.

Hitherto, I have only presented the favourable side of the picture to view; it now becomes a duty to exhibit its sad reverse! In doing this, however, I have the consolation of hoping that, sooner or later, it may induce those in whose hands alone the remedy is placed, to apply it efficaciously. I may add that the *rationale* which I have attempted of the disease, is equally elucidatory of the failure as of the success, in the *methodus medendi* recommended.

Those, then, who have had most experience in hot climates, best know the melancholy fact, that in every repetition of dysentery, and after every successive year of our residence between the tropics, we find the remedy has greater and greater difficulty in conquering the disease. In process of time, as the intervals between attacks become curtailed, we find it a very tedious process to bring the mouth affected with mercury; and, what is still worse, the check thus given to the complaint is only temporary; for soon after the influence of the medicine wears off, our patient returns upon our

hands as bad as ever. At length the system absolutely refuses all impregnation from mercury; and we have the mortification to see our patient waste away, and die, for want of the only remedy that possibly could arrest the hand of death—*change of climate!*

And how can it be otherwise, upon the principle which I have stated? The perspiratory and biliary vessels become gradually weakened, by their inordinate and irregular action, from the stimulus of atmospherical heat: they are consequently more and more easily struck torpid by the least atmospherical vicissitudes, and require the additional stimulus—or rather, the change of stimulus from medicine, to excite their healthy action. Hence, the longer we ring those changes, the nearer we approach that state when the vessels, at last, cease to obey all stimuli—the functions alluded to cannot be restored, and the unhappy victim dies! Add to this, that the intestines themselves become more irritable by every subsequent attack, and, even without any attack by the impaired state of the functions in question, which annually increases.

This view of the subject leads me to deplore the great waste of human life occasioned, in ships of war, by protracted stations in the East and West Indies! The notion that *time* seasons us against all other diseases, as well as yellow fever, cannot now be urged, for its fallacy is detected. From the great endemic scourge we might, in general, protect our seamen, by proper care; but over the disposition to dysentery and ulcers, in that class of Europeans, we have little control, since time itself is our adversary—*omnia metit tempus!*

I shall now advert to some more minute particulars in the treatment of this complaint, which, from the documents I have produced, and my own testimony, will, I trust, no longer be viewed in the terrific habiliments wherewith it is clothed by Dr. Moseley.

The use of opium in dysentery has been loudly applauded, and as unconditionally condemned. Yet here, as in many other instances, it is the *abuse* only which has brought odium on a valuable medicine. Opium will do harm, if given alone; particularly in primary attacks, and in young or plethoric habits. If alternated with purgatives, it will do little good—perhaps even harm. But if combined with calomel and antimonial powder, it will be found a most important auxiliary to these medicines, both by preventing any intestinal irritation from the one, and by increasing the diaphoretic effect of the other. All its injurious consequences (if any such result in this way) may be easily obviated by the lancet and laxatives, when symptoms require them.

The nitrous acid I have often found a useful adjuvant, particularly in secondary attacks, where the relaxed and weakened state of the bowels seemed to keep up the disease. A couple of drachms per diem, in barley or cungee water, will diffuse an agreeable sensation of warmth through the alimentary canal, and increase the tone of the intestines.

An infusion of quassia, or other light bitter, should be immediately commenced on leaving off the mercury, and continued till the stomach and bowels have recovered their vigour. This should never be omitted.

It is hardly necessary to remark, after the principles which I have laid down, that flannel next the skin is indispensable, and that the most scrupulous attention in avoiding dews, damp night air, or sudden atmospheric vicissitudes, is necessary during convalescence, to prevent a relapse.

In no disease is patience, on the part of the sick, a greater virtue, or more calculated to forward the good effects of medicine, than in dysentery. If obedience be paid to every call of nature, the straining which ensues is highly detrimental, and I am convinced, augments, in many cases, the discharge of blood—every motion of the body, indeed, increases the desire to evacuate. As little or nothing, except mucus and blood, comes away in four efforts out of five, we should endeavour to stifle the inclination to stool; and (as I know by personal experience) we shall often succeed; for the tormina go off in a few minutes, and by those means we elude not only the straining, but the painful tenesmus, which continues so long after every fruitless attempt at evacuation. This circumstance, though apparently of a trifling nature, is of considerable importance; and yet it has seldom been attended to, either by authors or practitioners. It has the sanction of antiquity, however, as may be seen in the following precept of Celsus—"Et cum in omni fluore ventris tum in hoc precipue necessarium est, non quoties libet desidere, sed quoties necesse est; ut *haec ipsa mora* in consuetudinem ferendi oneris intestina deducat."—*lib. iv. xvi.*

In the *chronic dysenteries*, which so perplex us after

returning from tropical climates, all those precautions and directions detailed under the head of *Chronic Hepatitis*, (with which the complaint in question is generally associated) will be found well worthy of attention —particularly flannels and occasional opiates.

The diet in dysentery must of course be of the most unirritating and farinaceous nature; such as sago, arrow root, rice, &c. A very excellent dish for chronic dysenteries, is flower and milk, well boiled together, which, with a very little sugar and spice, is highly relished by the debilitated patient.

But there is one remark applicable to this, and every febrile complaint, whatever may be the organ most affected; namely, that when convalescence takes place, the appetite too often outstrips the digestion, and so do chylification and sanguification exceed the various excretions, so as to occasion a dangerous inequilibrium between assimilation and secretion; the consequence of which is, that the weakest viscus, or that which has suffered most during the previous illness, becomes over-powered, and relapse ensues! This is the great error of inexperience, and it is generally seen too late—I appeal to clinical observation for the truth and the importance of these remarks.

Cholera Morbus, and Mort de Chien.

SEC. XI.—In no disease has a *symptom* passed for a *cause*, with more currency and less doubt, than in Cholera. From Hippocrates to Celsus, and from Celsus to Saunders, *bile* has been condemned, without a

hearing, as the original perpetrator of all the mischief. "Bilis sursum ac deorsum effusiones," says the first; "Bilis supra, infraque erumpit," says the second; and "Cholera Morbus," says the last of these authors, "may very properly be considered under the head of those diseases which *depend* on the *increased secretion* of bile." *On the liver*, p. 179. Yet I venture to affirm that Cholera does *not* "depend" on an increase, but on a diminution, and in many cases, a total suppression of the biliary secretion.

A very excellent description of the disease in question, as it appears in this country, will be found under its proper head, in Rees's new Cyclopaedia, written, I believe, by Dr. Bateman, and taken principally from Sydenham. I shall extract the following passage for my text: "The attack of this complaint is generally sudden. The bowels are seized with griping pains, and the stools, which are at first *thin and watery*, as in common diarrhoea, are passed frequently. The stomach is seized with sickness, discharges its contents, and rejects what is swallowed. In the *course of a few hours*, the matter vomited, as well as that which is discharged by stool, appears to be *pure bile*, and passes off both ways, in considerable quantities. The griping pains of the intestines now become more severe, in consequence of the extraordinary irritation of the passing bile, which excites them to partial and irregular spasmodic contractions. These spasms are often communicated to the abdominal muscles, and to the muscles of the lower extremities. The stomach is also affected

with considerable pain, and a sense of great heat, in consequence of the same irritation. There is usually great thirst, and sometimes a severe head-ache, from the sympathy of the head with the stomach. The pulse becomes *small and frequent*, and the heat of the skin is increased. A great degree of debility, languor, and faintness, amounting even to syncope, speedily comes on; sometimes attended with colliquative sweats, coldness of the extremities, "and such like symptoms," says Sydenham, "as frighten the bye-standers, and kill the patient in twenty-four hours."

Now it does appear somewhat curious to me, that if an increased secretion of bile were the *cause* of the disease, we should see nothing of it till—"a few hours" after the *effects* become obvious! Where is the increased secretion all the time? Not in the stomach, for it "discharges its contents, and rejects what is swallowed" long before. It is not in the intestines, for the stools are at first "thin and watery." At length, however, "*pure bile*" makes its appearance; and lo! it is accused of being the *cause* of all!

At what season does this commonly take place? In August and September. Certainly that is the time for great heat and increased action in the hepatic system. But are there no particular attendant circumstances? Yes, says the author of the foregoing passage, "It has been remarked, that both in hot climates, and in the hot seasons of mild climates, *occasional falls of rain* have been particularly *followed* by an epidemic cholera."—ib. Indeed! a fall of rain is wonderfully well

adapted to increase the secretion of bile! But again: "In some places it is probable, that the heat of the season may give only *a predisposition*, and that certain *ingesta*, sudden changes of temperature, or other causes, in this state readily excite the disease."—ib. All these are admirably adapted, no doubt, to produce a great flow of bile! But let us return to Dr. Saunders, who has already informed us, that Cholera "depends on the increased secretion of bile." He says, "it frequently takes place spontaneously, and independently of any sensible occasional cause. At other times, it is evidently connected with a sudden change of temperature in the atmosphere during those months (August and September) or brought on by drinking cold liquors, or by any thing else that suddenly chills the body, especially when overheated by exercise or labour.—p. 181. Now, in what manner we are to connect these "evident" causes with an "increased secretion of bile," Dr. Saunders leaves us to find out as we can, for he has not even attempted an explanation. But, in truth, to set about proving that *cold* increased the hepatic action, would have been inconsistent, after what he previously advanced respecting the operation of *heat* on the biliary system.

Having shewn, I think satisfactorily, the inadequacy of these doctrines to an elucidation of the phenomena, I shall proceed to prove, that an "increased secretion of bile," so far from being the *cause* of Cholera Morbus, is, upon the whole, *a favourable symptom*; and that, in the very worst forms of the disease, it is *entirely absent*.

In no part of the globe does this terrific disorder assume a more concentrated state than on the coasts of Ceylon, especially its eastern side. The mountains tower to a great height, in fantastic shapes, or conical peaks, clothed from base to summit with almost impenetrable forests of lofty trees, underwood, and jungle. Deep vallies and ravines, still more thickly covered with similar materials, and choaked up, as it were, with all the wild exuberance of tropical vegetation, separate the mountains from each other, and swarm with myriads of animals and reptiles. From these vallies, in the months of May, June, and July, when the S. W. monsoon is in force, the gusts of land-wind come down, hot and sultry by day, but chilling cold and damp by night. Where mountainous and woody, or flat, marshy, and jungly tracts, border on the sea, atmospherical vicissitudes will, *ceteris paribus*, be greater, than where the coast is flat and gravelly, or dry and eultivated. The reason is obvious. Thus, the vicinity of Madras, for instance, being a sandy or gravelly soil, which, during the intense heat of the day, acquires a temperature, perhaps 60 or 70 degrees above that of the contiguous ocean, a considerable share of the night elapses before the heat of the earth sinks to an equilibrium with that of the water; and consequently, we seldom have the land-wind cold there, except after falls of rain; and on the contrary, in May and June, it is hot throughout the night. At Ceylon, on the other hand, the surface of the ground being so defended from the sun's rays by woods and jungles, it never acquires any thing like the tempe-

rature of the opposite Coromandel coast; and although during the months alluded to, when the south-west monsoon passes with great strength over Ceylon, the wind by day be hot and sultry, yet, as soon as the dews have fallen in the evening, and evaporation commences from a very extended surface, the land-breeze is instantly rendered cold and raw; and being then loaded with vapour, together with all kinds of terrestrial and vegetable exhalations, communicates to our feelings and frames a chill, far exceeding what the thermometer would actually indicate. The same remark applies to Bombay; but in Bengal there are no regular sea and land breezes; consequently the changes of temperature are not so abrupt and extensive as in the fore-mentioned places.

Numerous cases, exhibiting the dire effects of these atmospheric vicissitudes, aggravated no doubt, by the land wind effluvia, now lie before me--effects, indeed, that might well "frighten the bye-standers," or even Sydenham himself; for the patient is often cut off in a much shorter space of time than "twenty-four hours!"

A seaman on board a ship, lying in Back-Bay, Trincomallee, in the month of June, went to bed rather intoxicated. About midnight, however, he turned out, in a state of perspiration, and got upon deck, as is very usual, where he lay down in the cold land-wind, and fell fast asleep. During the preceding day, the land-wind had been hot and sultry, the thermometer ranging from 86 to 88 degrees. In the night the mercury fell to 74° , with raw, damp gusts from the shore. About four o'clock in the morning, he awoke with a shiver,

and left the deek; but was soon seized with frequent purging and griping, his stools consisting of mucus and slime. Nausea and retching succeeded; nothing being ejected but phlegm, and the contents of the stomach. His pulse was now small, quick, and contracted—his skin dry, but not hot. About eight o'clock in the morning, he began to feel spasms in different parts of his body, which soon attacked the abdominal muscles, and threw him into great pain. During these paroxysms, a cold, clammy sweat, would be occasionally forced out, especially on the face and breast. The extremities now became cold, his features shrunk—the stomach rejecting every thing that was offered, either as medicine or drink. The abdomen and epigastrium, all this time, were distended and tense, with incessant watery purging and painful tenesmus. By ten o'clock, his pulse could scarcely be felt—his breathing was oppressed and laborious—his eyes sunk, and the whole countenance singularly expressive of internal agony and distress! The extremities were cold, shrivelled, and covered with clammy sweats. The violence of the spasms now began to relax; and by eleven o'clock, or seven hours from the attack, death released him from his sufferings! The warm bath, opium, æther, and various medicines had been tried, without affording any relief.

This may serve as a specimen of the worst form of that dreadful disease, which has obtained the appellation of—“*Mort de Chien*,” or the “Death of a Dog.” No bilious accumulations are to be seen, either in their stools, or what is ejected by vomiting, from the begin-

ning to the end of the disease. Neither is there ever the slightest appearance of '*natural and healthy perspiration.*' A watery fluid is occasionally forced out by the spasms and pain, while the skin is shrivelled and tense, and the sub-cutaneous, or perspiratory vessels, perfectly torpid.

From such an awful state of concentration, the disease assumes all degrees of violence, down to a common Cholera. In exact proportion as bile appears, and the nearer it approaches to a natural quality, so much the less is the danger.

A seaman, from like imprudent exposure to the cold land-winds, after great fatigue during the heat of the preceding day, was attacked with symptoms nearly similar to the former. After the spasms came on, however, he had cold and hot fits alternately, with corresponding sweats, and bile appeared occasionally, both by vomit and stool. He had swallowed a scruple of calomel, and in this case, blood was taken from the arm, which instantly alleviated the spasms. In a hour after the calomel was taken, a purgative enema brought off several copious alvine evacuations, followed by large quantities of bile, some of which was highly fetid and depraved. He now felt greatly relieved—fell into a fine perspiration and sleep, and by the next day was perfectly well.

I could here adduce numerous cases, both favourable and fatal, and little differing, in essential symptoms, from the two related above. But as the point which I have pledged myself to prove, must be decided by unequivocal and disinterested evidence, I shall bring for-

ward the testimony of Mr. Curtis, a most faithful and candid reciter of facts, as every page in his volume evinces.

It is necessary to recollect, that the disease which Mr. Curtis describes, and the place where it happened [Trincomallee] are those alluded to in Dr. Paisley's letter, where the latter affirms, and I think with justice, that *Mort de Chien* is nothing more than the highest degree of Cholera Morbus.

"Early in the morning of the 21st June," says Mr. Curtis "we had two men seized with the *Mort de Chien*, both of which we lost in a few hours; and in the course of the two following days, three more in the same complaint, without meeting with one fortunate case. To the 25th, when we sailed for Negapatam, we had three new cases of the same kind, all of whom were saved, but two of them with great difficulty. Besides these, we had several others, which were of a nature considerably different; being evidently combined with bilious colic in the first passages, a circumstance not at all discoverable in the five cases that ended fatally. All these [viz. where bile appeared] were found to be much more tractable—easily removed, and attended with little danger."—p. 48. "In all of them [the eight cases alluded to] the disease began with a watery purging, attended with some tenesmus, but little or no griping. This always came on some time in the night, or early towards morning, and continued some time before any spasms were felt." * * * * "This purging soon brought on great weakness, coldness of the

extremities, and a remarkable paleness, sinking, and lividness of the whole countenance. Some at this period had nausea, and retching to vomit, but brought up *nothing bilious*. In a short time, the spasms began to affect the muscles of the thighs, abdomen, and thorax; and lastly, they passed to those of the arms, hands, and fingers.”—p. 49. “The patients complained much of the pain of these cramps.—As the disease proceeded, the countenance became more pale, wan, and dejected. The eyes became sunk.—The pulse became more feeble, and sometimes sank as much, as not to be felt at the wrist.”—p. 50. “The tongue was generally white, and more or less furred towards the root, with thirst, and desire for cold drink.” “The coldness of the extremities, which was perceptible from the first, continued to increase, and spread over the whole body, but with *no moisture on the skin*, till the severity of the pain and spasms *forced out* a clammy sweat, which soon became profuse.”—p. 51. “All this time, the purging continued frequent, and exhibited nothing but a *thin watery matter, or mucus*. In many, the stomach became at last so irritable, that nothing could be got to rest upon it, every thing that was drank was spouted up immediately. The countenance and extremities became livid—the pulsations of the heart more quick and feeble—the breathing laborious. In fine, the whole powers of life fell under such a great and speedy collapse, as to be soon beyond the reach of recovery. In this progression, the patient remained from three to five or six hours, from the accession of the spasms, seldom

longer."—p. 52. "In the Seahorse, it attacked some remarkably robust, powerful, and muscular men, who had been in *perfect health immediately before*. Neither, in all our class of *bad and fatal cases*, did there appear any marks of *bilious colluvies*, either in the colour of the *ejected matter*—the state of the abdomen, or the appearance of the tongue, eyes, and urine."—p. 56. "We had, indeed, another set of cases, where the presence of this [bile] was distinguishable by *all these characters*, but *these* were of a far *slighter* nature, and *none* of them turned out any way untractable or fatal. And again, at Madras, Mr. Curtis observes—"Out of about twenty under my care, a *third* were evidently connected with *bilious colluvies*; and in *these* there was no great sinking of the pulse, or diminution of the heat, and the spasms were confined to the legs and feet."—p. 69. These all recovered. Lastly, in two cases of dissection which took place immediately after death in this disease, Mr. Curtis affirms that—"there were *no bilious accumulations* found any where, and the internal organs were all in a sound state; only there was more water than natural in the pericardium, and the vessels of the lungs, liver, and mesentery, appeared to be very *turgid and full of blood*."—p. 72.

I appeal to every unbiased mind—nay, to prejudice itself, whether I have not now proved (I had almost said to a demonstration) the truth of that heterodox position with which I set out—namely, that "*an increased secretion of bile*," so far from being the *cause* of Cholera Morbus, is, upon the whole, a *favourable*

symptom; and that in the very worst cases of the disease, (*Mort de Chien*, for instance) it is *entirely absent*.

This point being settled, the application of that principle, to which I have so often adverted--*the connexion or sympathy between the functions of the skin and liver*, will afford a more rational explanation of the phenomena, than either “an increased secretion, or a lurking, putrid accumulation of that far-famed mischief-maker—**BILE**.

The sudden and powerful check to perspiration—the unparalleled atony of the extreme vessels, debilitated by previous excess of action, and now struck utterly torpid, by the cold, raw, damp, nocturnal land-winds, loaded with vege-to-aqueous vapour, and abounding with terrestrial and jungly exhalations—break at once, and with violence, the balance of the circulation. The extreme vessels of the hepatic system, sympathising with those on the surface, completely arrest the reflux of blood from the portal, cœliac, and mesenteric circles; hence, in the worst cases, a *total suppression* of biliary secretion, with distension of the abdomen, and shrinking of all external parts. If this continue any time, as in *Mort de Chien*, death must be the inevitable consequence, notwithstanding the unavailing efforts which Nature makes, by vomiting, to determine to the surface—restore the equilibrium of the blood and of excitability, and, with them, the functions of perspiration and biliary secretion. In proportion, then, as the two latter appear, will the danger be lessened—our most salutary objects attained, and the disease become “less untractable and fatal.”

The deluges of bile which occasionally burst forth on the *re-commencement* of secretion in Cholera, are the natural consequences of the great plethora in the portal and other abdominal circles of vessels, which took place during the previous check to biliary secretion, and free passage of blood through the liver. And thus we see, that the very *last* link in the chain of effects, and that too a *salutary* one, has, for ages, been set down as the cause of Cholera—"increased secretion of bile!"

With respect to the spasms, as they are totally unaccounted for by my predecessors, neither am I bound to dive into the mysteries of the nervous system, for a solution of the phenomenon. I think I have pretty clearly proved, that they are not attributable to bile; since, in the most dangerous and fatal cases, no bile is to be found. I can easily conceive that the brain must suffer, from the broken balance of circulation, as well as from its known sympathies with the stomach and liver, and thus, in some measure, account for the unequal distribution of nervous energy, which may excite cramps, and throw various classes of muscles into convulsive agitations. I am the more disposed to this opinion, from the circumstance, that in three desperate cases of *Mort de Chien*, the spasms were instantaneously relieved by venesection. In one of them which happened on board the Centurion, *trismus* (an unusual symptom) had taken place—the eyes were fixed, and the pupils dilated. Bleeding was attended with immediate good effects, and the patient was well next day.

Having mentioned trismus, I may here remark, that

Mort de Chien must not be confounded with that of tetanus. For although the latter have arisen from checked perspiration in many instances, they are totally different from the disease under consideration. The gastric irritability, and dysenteric purging, might be a sufficient diagnosis; but the spasms themselves are dissimilar. In *Mort de Chien*, the affection is not confined to a particular class of muscles; it passes from one to another, and those of the neck, face, and back, are almost always exempted. Neither is it a *rigidity*, but a fixed *cramp* in the belly of the muscle, which, as Mr. Curtis justly observes, "is gathered up into a hard knot with exruciating pain." Lastly, the vascular system is infinitely more affected in *Mort de Chien* than in tetanus, and the fatal termination, beyond all comparison, more rapid.

Nor is this investigation of the *proximate cause* of Cholera, a subject of mere curiosity; it is highly useful; inasmuch as it strongly confirms and elucidates the principle which I have kept in view through various diseases in this essay; and what is of more consequence, it points directly to the most indispensable part of the cure, in the awful and terrific forms which the disease assumes in these parts of the world—namely, *the early restoration of balance in the circulation and excitability*; an indication but little dreamt of in the old *bilious theory*, where every eye was kept fixed on the lurking demon—*BILE!*

"In strong habits," says Dr. Paisley, "when the pulse keeps up, evacuations should be promoted both ways, by a vomit of two or three grains of *emetic tar-*

tar."—*Curtis p. 86.* But soon after, he observes, "In relaxed habits, where the pulse sinks suddenly, and brings on immediate danger, the *same method must be pursued*, but with greater caution. The emetics and purges must be gentle, and made cordial with wine, and sp. lavend. Laudanum must be at hand, *to gain time*; and though it is a *dangerous expedient to suspend evacuations where putrid bile lurks*, yet, of two evils, the least is to be chosen; for the patient must sink to death, if a respite from evacuations, pain, and spasm, is not procured." Nothing so true as this last. Nature is here, as it were, stunned with the blow; and the struggling efforts which she makes to relieve herself, by vomiting, &c. only exhaust her the sooner, if not effectually assisted by art. We must therefore have recourse to more powerful means than wine, laudanum, or lavender. The warm bath—cordials of the most stimulating kind, such as warm punch, or toddy, must be added to opium and calomel, together with friction, hot flannels, &c. In short, every means must be tried to determine to the surface, restore the equilibrium of the circulation and excitability, and with them natural perspiration (not the clammy fluid forced out by pain and spasm, but a mild, warm sweat) and biliary secretion. Calomel must never be omitted, because it answers a triple purpose:—it allays the inordinate gastric irritability—it excites the action of the liver—and it corrects the constipating effects of the opium; so that, when the orgasm is over, some gentle laxative medicine may, with it, carry off the diseased secretions, which must sooner or later take place, if re-action can be brought on, or recovery effect-

ed. When all medicines by the mouth have been ineffectual, in allaying the orgasm of the stomach and bowels, laudanum, by way of injection, has succeeded, and should be had recourse to, though it is generally neglected. I have not mentioned venesection, though, from its instantaneous good effects in three desperate cases, I am inclined to think it might prove a powerful auxillary in relieving the brain, and other internal organs, when overwhelmed with blood, even anterior to re-action; and also by moderating the violence of the re-action itself. This idea is strengthened by the success which has lately attended depletion in various forms of *spasmodic diseases*, and by the following extract of a letter from my able friend Mr. Sheppard:

*Extract of a Letter received by the Author from Mr. J. B.
SHEPPARD, Surgeon, of Witney.*

"Your account of Dr. Moulson's paper brings to my recollection a practice somewhat analogous (though with a different intention) which I pursued during a short service in the Brazils, a few years since, in the violent form of cholera which seems to be endemic there. You have, I believe, described a similar disease, in India, under the name of *Mort de Chien*, in which you recommend bleeding with other remedies; but I have now reference only to the notes which I made of your book, and therefore am not positive. In more than forty cases which came under my care, during the four months we were in the harbour of Rio Janeiro, and on the coast, I found bleeding to *Syncope* instantly and uniformly successful alone. There was no critical biliary discharge, but the disease was removed before the arm was secured, and no subsequent medicine was required. The intestinal spasm was far more violent than any I had ever witnessed in the West Indies, (where the disease is pretty severe) and bore a strong resemblance to the convulsive paroxysm; so much so, that I was generally called to patients said to be in fits; and the powers of several men were required to restrain them. The first cases I treated by warmth, frictions, volatiles, and opium, but did no good until I adopted the plan I have mentioned, which, in no instance disappointed me;

the variations of temperature in that climate are extraordinarily great, frequent, and sudden : and to such mutations the prevalence of intestinal spasms may be ascribed.”*

“I had heard much,” says Mr. Curtis, “of latent and lurking bile, as the general source of India diseases, and resolved to seek for and hunt it out, by the means employed by others—viz. repeated small doses of sal. glaub. in aq. menthae piper. sharpened with a very small proportion of emetic tartar. This plan was accordingly tried with our next patient. He threw up a *very small quantity* of greenish coloured bile, and the solution operated much downwards, without any relief or discharge of bilious matter.”—p. 59. After the warm bath, opium, and mulled wine, had been tried without success, Mr. Curtis continues.—“A warm, purgative glyster was given him, but was followed by *no bilious discharge*. No vomiting continued after the first exhibition of the purgative, but a repetition of it, to see if *any bile lurked still in the stomach*, and could be solicited downwards, brought on continued retching, and he threw up every thing after this till his death.”—ib. Mr. Curtis now gave up the pursuit of “lurking bile,” and saved his next two patients by the warm bath—frictions with hot arrac—wrapping them up in blankets, and supplying them with warm tea and arrac, till perspiration broke out, when they were relieved, and soon recovered.

It is only necessary to remark, in conclusion, that in

* Mr. Sheppard will see a striking elucidation of this subject in a case of hydrophobia, by Mr. Webster, related in the Medico Chirurgical Journal. Dr. Saunders of Edinburgh, has long been investigating these points of pathology, and will, we hope, soon lay the results of his labours before the public.

the milder cases of *Mort de Chien*, corresponding to common *Cholera Morbus*, when the bilious vomiting and purging appear, nature has then repelled the original cause of the disease, and is fast advancing with the cure. We have only now to moderate and regulate her hurried, and, as it were, frightened movements, by opium and calomel, in pretty large doses; the former, as I have before hinted, in glyster; and when all is quiet, to carry downwards, by mild laxatives, the effects of the disorder, and its cure—*Diseased secretions of bile.*

BERIBERI.

[FROM DR. CHRISTIE's REPORT.]

SEC. XII.—The *Beriberi* is a disease of a peculiar nature, which has been extremely frequent, and fatal amongst all the troops, both *Europeans* and natives in Ceylon. In the milder cases of this disease, the patients are first attacked with some stiffness of the legs and thighs, and this is succeeded by numbness and œdema, sometimes paralysis of the lower extremities.

In the course of a few days, if not prevented by medicine, these symptoms are succeeded by swelling of the whole body, attended with a sense of fulness of the belly, and more particularly with weight and oppression at the præcordia; dyspnœa, starting in the sleep, and all the usual symptoms of hydrothorax. In the latter stage, the dyspnœa and anxiety become extreme, the uneasiness at the epigastrium increases, attended with almost constant vomiting, and occasionally spasms of different muscles: the pulse becomes very feeble, the

lips and countenance livid, and the extremities cold.

Some fever, with delirium, often now accede, and terminate the life of the unfortunate sufferer. In the more sudden and severe instances, the patients, from the first, complain of universal debility and extreme oppression, anxiety and dyspnœa. In some of these instances, the progress of the disease is so rapid, that it carries off the patient in six, twelve, twenty-four, or thirty-six hours, after its first attack: more frequently, however, its duration is for several weeks.

In a few cases, where the disease was no less fatal, there was not any swelling observable externally; but the patient with the other symptoms, had evidently the bloated leucophlegmatic face of a dropsical person.

Upon dissection of different subjects, who had died of this disease, more or less water was found in one or all the cavities of the chest; most commonly in the pericardium, but in general, more inconsiderable than might have been expected from the violence of the symptoms. The cellular substance surrounding the heart was, in some instances, loaded with water; and the heart seemed, in two or three cases, of an uncommon size. In one instance, in which the progress of the disease had been very rapid, I found a large coagulum of lymph in the right auricle. The cellular substance of the lungs was, in many cases, loaded with water. In a few cases, also, there was water effused in the cellular substance on the surface of the brain; and, in one instance, more than an ounce of water was collected in the ventricles. In most cases, water was found in the abdomen, and cellular membrane through-

out the body; and, in many subjects, there was a remarkable obesity, even after a long continuance of the disease, and of the use of mercury, antimony, and other powerful medicines. Men of every constitution are occasionally attacked with the *Beriberi*, but the aged and debauched seem to be most liable to it; and men who have once had the complaint, are the most subject to it in future. I have remarked that a very great proportion of the patients, seized with this disease, were men who were accustomed to lead a sedentary and debauched life, such as taylors, shoemakers, &c. who, when working at their trade, are often excused the duty of the field, and, by their double earnings are enabled to procure a larger quantity of spirits than the other men.

I have never met with an instance of this complaint in a woman, an officer, or a boy, under 20; although persons of every description seem equally liable to the other diseases of the place, such as fever, flux, or liver complaint.

It would appear that a stay for some months on the station, is almost essential for the production of the disease; and that the greatest predisposition to it exists, when troops have been about eight or twelve months in the settlement.

The 72d regiment and Coast artillery landed here in July 1795. The *Beriberi* was with them most prevalent in the autumn of 1796; but they had little of it in March 1797, when it was extremely frequent with the first batalion *European* infantry, who had arrived here in August 1796.

The 80th regiment relieved the 72d in March 1797,

but suffered little from the disease till the November following. The Honourable Company's *Malay* corps arrived here, from *Jaffnapatnam*, in June 1797; but the complaint did not appear amongst them till the January following, when it became very frequent and fatal. Two hundred drafts joined the 80th at *Trincomallee*, on the 3d of January 1798; but none of these men had the disease in January, February, or March although it was then very frequent with the other men of the regiment: since that time, however, these drafts have been at least as subject to it as the other men.

Various modes of cure have been attempted in this disease: but I have of late uniformly pursued the following plan with uncommon success.

In the more mild cases, the patients are immediately put upon a course of calomel and squills. The perspiration and other evacuations are promoted by saline drinks, or small doses of antimonial, or James's powder; and the strength supported by cordial liquors, most generally gin punch, which assists much the effect of the squills.

By these medicines, the symptoms are very often removed in the course of a few days; except the numbness of the extremities, which generally remains longer than the rest. Pediluvium and stimulants are then ordered to the extremities, and the patients are put upon a tonic plan, of bark and wine, or porter, which is continued for some time after all the symptoms have disappeared. In the more severe cases, where the dyspnœa, vomiting, spasms, or other symptoms are violent, it is necessary to apply blisters to the breast, to make use of fomentations, and the hot bath, and to exhibit the strongest cor-

dials, and antispasmodics, as brandy, and particularly laudnum and vitriolic æther. By these means I have, in most instances, been enabled to relieve the dyspnœa, and other urgent symptoms; and procure time for the exhibition of the medicines mentioned above, which it is sometimes necessary to use for several weeks.—*Christie's Report &c.*

THE DRACUNCULUS, OR GUINEA WORM.

SEC. XII.—Although this worm attacks most parts of the body, it shews a preference to the lower extremities, particularly the feet and ankles, where it is painful and dangerous in proportion as the parts are thinly covered with flesh. It is difficult to extract it from the tarsus and metatarsus—sometimes impossible from the toes. The consequences are often, tedious suppurations—contractions of the tendons—diseases of the joints—Gangrene. When the worm is pulled, the pain is sometimes excruciating as the animal would appear to attach itself to the nerves, ligaments, and tendons. The track of the worm seems to be in the cellular membrane, rarely deeper. There are seldom any premonitory symptoms. The presence of the disease is usually announced by itching, redness, and heat in the skin of the part, succeeded by a vesicle, with some swelling and inflammation. Under the vesicle, which contains a white, thick mucus, the head of the worm may be generally discovered; but sometimes not till several days after the ulceration. Occasionally a small ulcer is the first thing observed; at other times, tumour of the whole limb, with much inflammation. The worm sometimes

appears like a hair, several inches long, and becomes thicker as it is extracted; but it generally has a sharp point, and is all of the same thickness. It may often be felt and traced by the fingers, like the string of a violin, under the skin, where it excites no very sensible uneasiness, till the skin is perforated by the animal.

When removed from the body it exhibits no appearance of life, even when extracted at one operation. In length, it varies from 18 inches to six feet. It is elastic, white, transparent, and contains a gelatinous substance.

When the disease is seated in parts that are tender—when there is extensive ulceration—or where the constitution is irritable, there is generally some fever, loss of appetite, debility, and evening exacerbation, especially if the worm happen to be drawn too tight. Swellings of the inguinal glands are sometimes sympathetically induced when the complaint is situated in the lower extremities.

Various have been the opinions respecting the generations of this insect. Both ancients and moderns have attributed its production to the drinking of putrid stagnant waters containing the ova of the worm. Some have regarded the worm as produced from ova deposited in the skin by insects. This last supposition is by far the most probable, notwithstanding the ingenious arguments brought forward by Dr. Chisholm, in favour of the aqueous generation, and for the following reasons:—1st. The disease most frequently attacks those parts of the body that are exposed to wet, as the feet and legs. Thus the Bheesties or water carriers in India, who carry the water in leather bags on their backs,

are observed to be much afflicted with Guinea worm in those parts that come in contact with the mushuk or bag.—2d. It prevails in wet seasons, and damp situations more than in dry.

Many causes, however, may contribute to the production of the disease, as confinement, heat, want of cleanliness in person and habitation, &c. and the means of prevention are founded on these premises, viz. cleanliness—avoiding dampness—keeping the feet and legs covered, [which few European soldiers and sailors, attend to in tropical climates] bathing in the sea, in preference to lakes and rivers—and avoiding contact with those infected; for there is great reason to believe that the disease is propagated by contagion when once produced by other causes.

Methodus Medendi.—Mercury, carried to the length of impregnation of the system,* has been considered by some as a specific, and so has assafoetida in Guinea worm; but the local means are those most to be depended on. *Sublata causa, tollitur effectus.*

When an inflammatory tumour ushers in the disease, leeches, cataplasms, fomentations, and other antiphlogistic measures are to be pursued, till suppuration occurs, and the head of the worm becomes apparent. It should then be seized by the forceps, and pulled very gently and gradually until there be a little resistance, and the worm becomes moderately tight. The extraction is often facilitated by friction with warm oil, and well adjusted pressure in the line of the worm towards the wound. When as much of the animal has

* Vide Chisholm in Edin. Journal, vol. II.

been drawn out as the resistance and pain will admit, the end of it should be secured by a ligature or thread passed round it; the thread should then be tied to a piece of small bougee, twisted lint or small quill, an inch and a half in length, and, with the slack part of the worm, is to be rolled up until it be moderately tight, taking care that it be not on the stretch, as it will occasion fever, or endanger the breaking of the worm. A piece of adhesive plaster is necessary to retain it in its place, and poultices may be continued, especially where there is tumour, to promote a discharge and the expulsion of the worm.

In general, the extraction should only be attempted once in the twenty-four hours. Sometimes a foot of worm can be extracted at once, sometimes not an inch. When the whole is drawn out, the sore may be treated as a common ulcer, making moderate pressure on the original track of the worm.

When by injudicious extraction the animal is broken, then tumour, fever, and tedious suppuration in that or other parts are the frequent consequences. Here recourse must again be had to fomentations and cataplasms, until the ruptured end of the worm can be again discovered, and laid hold of.

When the worm can be distinctly felt by the fingers under the skin, before breaking through, it is advisable to extract it by means of a small incision made over the part where it is most superficial, and as near as possible, over its middle. A ligature should then be applied, and the worm extracted double, in the manner before mentioned.—*Bruce.*

